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THE FORMULATION OF A CONSOLIDATED
UNDERGRADUATE HELICOPTER PILOT TRAINING SYLLABUS

A thesis presented to the faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

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by

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Fort Leavenworth, Kansas
1993

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (Reference to this study should include the foregoing statement.)

ABSTRACT

THE FORMULATION OF A CONSOLIDATED UNDERGRADUATE HELICOPTER PILOT TRAINING SYLLABUS by LCDR John T. Finch, USN, 109 pages.

The U.S. Armed Forces operate two separate undergraduate helicopter pilot training (UHPT) programs: the Army Initial Entry Rotary Wing (IERW) Training course and the Navy Undergraduate Helicopter Pilot Training program. For over twenty years, proposals have been made to consolidate the programs to eliminate redundancy and increase efficiency within the Department of Defense. Consolidation could be implemented in various forms, ranging from collocated, independently operated programs, to a completely consolidated joint program. A decision beyond simple collocation of separate programs would establish the need for a consolidated syllabus. This study examines the formulation of a consolidated UHPT syllabus from the syllabi of the current programs.

Past proposals and studies have highlighted difficulties that might be encountered in formulating a consolidated syllabus. This study considered the formulation of a consolidated syllabus by exploring the nature of the instruction in the current programs. The programs were evaluated and compared against selected criteria to identify common elements.

The study concluded that sufficient commonality exists between the two programs around which to form a consolidated core syllabus. Recommendations include proposals for syllabi with cores containing varying degrees of common instruction, and proposals for tailoring additional instruction to meet the individual services' needs.

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LIST OF ABBREVIATIONS

AN	Airway Navigation
ACS	Advanced Combat Skills
API	Aviation Preflight Indoctrination
BCS	Basic Combat Skills
BI	Basic Instrument
CP	Cockpit Procedures
CPT	Cockpit Procedures Trainer
DOD	Department of Defense
EP	Emergency Procedures
FAM	Familiarization
HTAC	Helicopter Tactics
IERW	Initial Entry Rotary Wing
INT	Intermediate Helicopter Training
MULTI-A/C	Multi-aircraft
NATOPS	Naval Aviation Training and Operating Procedures Standardization
N/NVG	Night/Night Vision Goggle
ON	Operational Navigation
PRI	Primary Flight Training
RI	Radio Instrument
SAR	Search and Rescue
SQ	Ship Qualification

TERF L/L, NOE	Terrain Following Flight Low Level, Nap of the Earth
TF	Transition Flight
UHPT	Undergraduate Helicopter Pilot Training
UPT	Undergraduate Pilot Training

CHAPTER 1

INTRODUCTION

Background

In the post-Cold War debate over the size and role of the U.S. armed forces, it will be more important than ever that the services make the most efficient use of the limited resources available to them. One concept currently under study that potentially meets that objective is the consolidation of Undergraduate Helicopter Pilot Training (UHPT) for all four services.

This study will answer the questions "Can a consolidated UHPT syllabus be formulated from the two UHPT programs that currently exist? If so, what should a consolidated UHPT syllabus consist of to meet the needs of all the services?"

The Department of Defense faces an enormous challenge to continue to perform its mission, while that mission is being redefined, with fewer people and less money. It is in this context that a review of interservice redundancy has once again revived interest in the issue of consolidating UHPT.

Consolidation is not a new subject. The first proposal to consolidate UHPT was discussed in Congress in

1970¹. In the years since, consolidation has been proposed, studied and recommended numerous times. There were funding requests in Federal budgets for Fiscal Years (FY) 78, 79, 80 and 82. It came closest to actually being achieved in 1980 when the Navy began taking the initial steps to send its students to Fort Rucker for UHPT with the Army.² Funding for consolidation was, however, never approved, losing support before it could win final approval.

The issue surfaced again in the 1980's at the prodding of Senator Barry Goldwater who urged the Secretary of Defense to approve consolidation. This resulted in the Senate Armed Services Committee direction to the General Accounting Office (GAO) to study the issue in 1985. The GAO report did not recommend consolidation at that time.³ The concept received additional attention in studies by the Interservice Training Review Organization (ITRO) in 1991 and a Defense Management Report (DMR) in 1992. DMR 962 identified some possible benefits of consolidation and lead to the formation of a working group for further study of consolidation.

While several of these studies have recommended consolidation, it has lacked support for a variety of reasons ranging from service parochialism to political objections in Congress. But the debate continues, being kept alive for over twenty two years. The center of the debate is that two separate UHPT programs are redundant.

Further impetus to drive consolidation was provided by the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (GNA). While the main focus of GNA was to enhance interoperability and increase the effectiveness of joint service operations, other issues such as training and procurement have come under scrutiny with the same objective in mind.

To understand the issue of consolidation, a review of the programs that currently exist and their major differences is necessary.

Historically, the Army, Navy and Air Force have operated separate pilot training programs.⁴ Currently, the Army and the Navy conduct all helicopter pilot training for the four services in two independent programs. The Air Force trained its own helicopter pilots at one time, but found it more cost effective to train their small number of pilots in the Army system. Since the Marine Corps and Coast Guard have organizational relationships with the Navy, their pilots have traditionally trained within the Navy program. (Further use of terms such as to "Army students" or "Navy students" includes all students, of whatever service, trained in that program.)

The Army's UHPT program, known as Initial Entry Rotary Wing (IERW) training, is conducted at Fort Rucker, Alabama.⁵ Commissioned and warrant officers begin their training with an indoctrination period and then move into

the IERW Core syllabus, where they receive classroom, simulator and flight training in the UH-1 aircraft. During the Core phase, student aviators receive at least 80 hours of flight instruction, the last 20 of which is focused on instrument flight skills.⁶ Upon completing the Core syllabus, students progress into an advanced phase of training known as Tracks. Here students learn "skills and knowledge for qualification and designation as an Army combat aviator"⁷, to be able to subsequently fly the aircraft found in Army field aviation units. There are currently Tracks for UH-1, AH-1, UH-60 and OH-58 aircraft.⁸ Advanced training for other Army helicopters is handled by other means and will not be addressed in this study. Students receive approximately 80-90 additional flight hours in their respective Tracks⁹ and are designated as qualified aviators upon successfully completing their Track. At this point, Army helicopter pilots receive their initial assignment to field aviation units. Figure 1 is a summary of the Army IERW program.

The Navy's UHPT program is part of its Undergraduate Pilot Training (UPT) program. Student Naval Aviators (SNA), all commissioned officers, begin their training with an indoctrination period followed by the Primary phase of flight training conducted in the T-34C fixed wing training aircraft. After approximately 66 hours of training¹⁰, SNA's make a pipeline selection for additional training in rotary

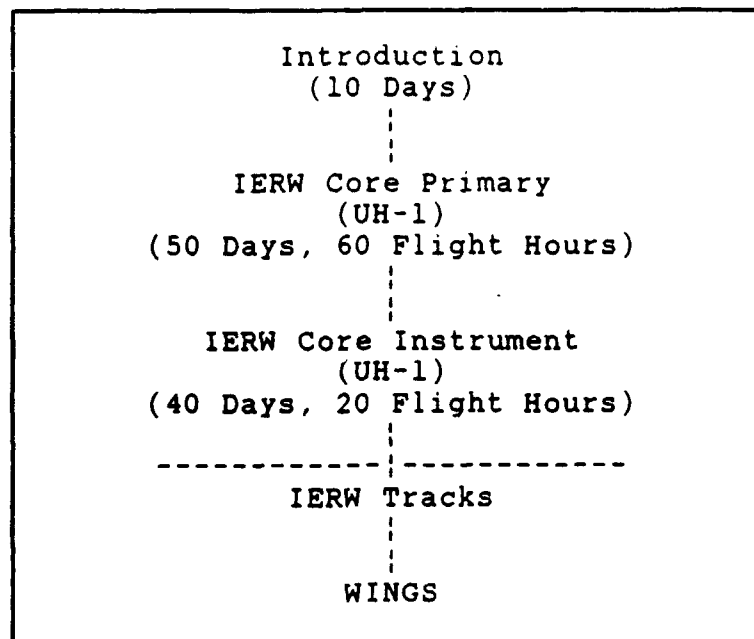


Figure 1. Army Initial Entry Rotary Wing (IERW) Training

wing, jet or maritime patrol aircraft. Those pilots who enter the rotary wing pipeline receive an additional 26 hours of fixed wing training in the Intermediate Helicopter phase.¹¹ This training concentrates on instrument flight skills. Following the Intermediate Helicopter phase, SNA's enter the Navy UHPT program where they receive 116 hours of training in the TH-57 helicopter.¹² Upon successful completion of the UHPT syllabus students receive their wings as qualified aviators. They are then assigned to a Fleet Replacement Squadron (FRS) for advanced helicopter training. FRS training is conducted in the aircraft Naval aviators will fly in their initial fleet squadron assignment. Figure 2 summarizes Navy UHPT.

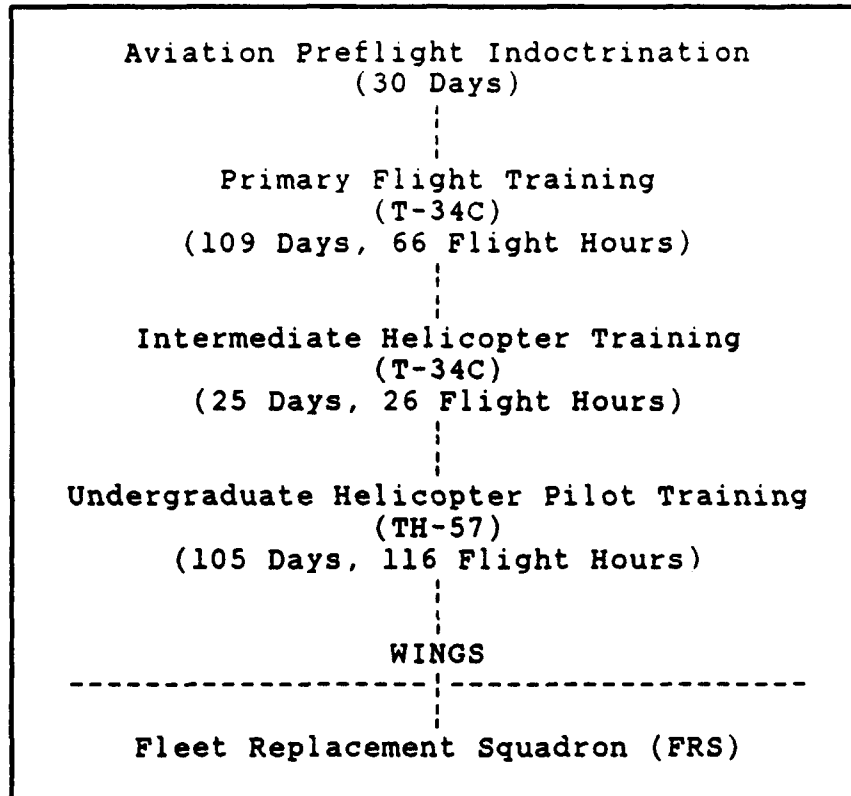


Figure 2. Navy Undergraduate Helicopter Pilot Training (UHPT)

Two major differences in the two programs deserve further discussion at this point as they relate to the issue of consolidation.

First, is the Navy's use of fixed wing training for its helicopter pilots. The Navy UHPT program is just part of the Navy's overall UPT program of which the fixed wing training is an integral part. The Army IERW program uses exclusively rotary wing aircraft to train its helicopter pilots. The fixed wing training issue will be discussed in greater detail at a later point.

A second major difference in the two programs is the timing of the "winging" (designation as a qualified aviator) and progression to the advanced phases of training. In the Army's program, students receive both undergraduate and advanced helicopter training within the framework of the IERW program and are designated as qualified aviators following successful completion of the advanced or Track training.¹³ By contrast, students in the Navy program receive their wings after the UHPT syllabus¹⁴ and before they progress to advanced training in the FRS. It is also important to note that the FRS's are outside of the Navy's training organization.

This review of the current programs serves as the background for a more detailed discussion of consolidation. The focus of past proposals to consolidate UHPT has centered on all training being conducted at Fort Rucker. The two main reasons for this are the Navy UHPT program produces a smaller number of pilots annually, and, the Army facilities had excess capacity to handle a consolidated flight program Fort Rucker.¹⁵

Consolidation in various degrees has been considered, ranging from two collocated, but independently run programs to a single organization providing instruction to pilots of all four services. Proposals have also been made for programs with and without fixed wing training for Navy students.

This study will focus essentially on the issue of a common syllabus for a consolidated UHPT program. Specifically, the primary research question that will be answered is: Can a consolidated UHPT syllabus be formulated from the two UHPT programs that currently exist? If so, what should a consolidated UHPT syllabus consist of to meet the needs of all the services?

Some of the secondary questions that will be answered are:

1. What is the make up of the current programs?
2. What are the appropriate criteria for comparing the current programs?
3. How much commonality exists, and at what levels, between the current programs?
4. How should service unique training be accommodated within a consolidated syllabus?
5. What impact do the changes caused by a consolidated syllabus have on other aspects of the training process?

Assumptions

To begin a study of the formulation of a consolidated UHPT syllabus, some assumptions are necessary.

The first assumption is that consolidation has been mandated by higher authority and it will be implemented in such a way that formulation of a joint core syllabus is necessary. Specifically, this eliminates from consideration an evaluation of independent service training operations,

all collocated. This allows the study of the syllabus issue without the burden of directly evaluating the feasibility of consolidation, that is infrastructure, manning, cost effectiveness, etc. However, some discussion of possible consolidation alternatives is necessary to the extent that the organization of a consolidated program would affect the syllabus requirements.

Next is that UHPT can be conducted without fixed wing training. Although this has been a central issue in many of the studies done to date, it is reasonable to make this assumption by simply noting that the Army program consists exclusively of rotary wing training. The assumption is imperative because it allows evaluation of the syllabus issue without an analysis of the numerous and complex factors associated with the Navy's rationale for retaining fixed wing training in a rotary wing program.

Additionally, that there are bonafide areas of commonality and that a true basis for comparison exists. For example, both services fly versions of the H-60 helicopter.¹⁶ While they are equipped with different avionics and perform different missions, the mechanical aspects of the airframes are essentially the same. Therefore, if both UHPT programs train pilots who receive advanced training in the H-60 helicopter, it follows that there should be skills that are common to both programs.

Next, that a consolidated UHPT program must maintain or exceed the quality of training that now exists and that it will meet the needs of both services. Therefore, any syllabus that this study proposes or recommends must meet the needs of the services as defined in the analysis of the programs.

Finally, as this study uses the training programs of each service as the basis to formulate a consolidated UHPT syllabus, the study assumes that the current programs reflect the desires of the services and meet their needs in terms of the quality of the pilots they produce.

Definitions

The following terms are defined for the purposes of this research:

Undergraduate Helicopter Pilot Training (UHPT). UHPT includes all training that an individual receives from the time they enter either the Army or Navy program. This includes indoctrination, academics, simulator and flight training. Indoctrination is the process of orienting new students to the administrative aspects of the organization and system that conducts the training. Academics covers classroom instruction on a variety of subjects relating to basic aerodynamics and aircraft systems, navigation and communication procedures, emergency procedures, etc. Simulator and flight training include various phases that develop the skills necessary to actually fly the helicopter.

The term Undergraduate Helicopter Flight Training (UHFT) used by the Navy is synonymous with UHPT.

Consolidation. The term consolidation is used to describe the process of merging, to an unspecified degree, the current Army and Navy UHPT programs. As addressed under Assumptions, the only stipulation concerning the structure of a consolidated program is that, at a minimum, it creates a need for a consolidated core syllabus.

Common Core Syllabus. The common core syllabus is defined to include all training determined to be of common benefit to helicopter pilots of all the services. Additional service unique training would be accommodated by phases of training subsequent to the core syllabus and would bring an individual to the level of training necessary to proceed with his service's advanced training.

Advanced Helicopter Pilot Training. The advanced phase of training is the instruction an aviator receives on specific mission type skills in the specific aircraft that they will fly in a field aviation unit or fleet squadron. The advanced phases as they currently exist are the IERW Tracks in the Army syllabus and Fleet Replacement Squadron training for Navy pilots.

Limitations

The first limitation is the absence of any definitive study used by either service that defines an objective, nominal level of basic knowledge and skills

required of any military helicopter pilot. One outcome of this study should be a definition of that objective, in the context of a consolidated UHPT program, derived from an analysis of the current programs.

A second limitation is the parochial influence of the services on the information in various studies on consolidation. Although these studies are not the primary sources for my research, they contain information that is important to the study and information from them must be used as objectively as possible.

Delimitations

The primary delimitation of this study is the selected area of research, that is, a common core UHPT syllabus. Consolidation of UHPT is a complex issue. By making assumptions and then focusing on this specific area, the study can proceed without addressing some of the more parochial and emotional issues.

As previously stated, this study will deal with the undergraduate, as opposed to the advanced, phase of helicopter training. Should the study determine that the recommended UHPT consolidated core syllabus would have an impact on the advanced phases of training, those effects will be designated as issues for further study.

Significance

The significance of this research is that it contributes to the body of knowledge in the ongoing evaluation of the concept of consolidation. While the specific recommendations for a consolidated syllabus provided here may not be adopted in whole or part, the methodology used is noteworthy in its simplicity. By adopting the assumptions and delimitations, a framework has been created that allows a true comparison of existing programs free of parochial and emotional arguments that are so much a part of previous studies.

Likewise, in the process of studying the formation of a consolidated syllabus, this research may contribute to the overall understanding of joint issues and resolution of potential problems in the area of consolidation of any multiservice functions.

Endnotes

1. Department of Defense Inspector General, Acquisition of Common Aircraft for Navy and Air Force Undergraduate Pilot Training (UPT) Audit Report Number 92-063 (Washington: Department of Defense, 1992), 97.

2. Ibid., 98.

3. Ibid., 98.

4. Richard W. Stokes, Jr., "Joint USN/USAF Pilot Training: An Operational Concept," (Monograph, U.S. Naval War College, 1989), 3.

5. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course Program of Instruction (POI) (Fort Rucker: Department of the Army, January 1990), 5.

6. Ibid., 22.

7. Ibid., 7.

8. Ibid., 17.

9. Ibid., 22.

10. U.S. Navy, Primary Flight Training (T-34) Master Curriculum Guide (Corpus Christi: Department of the Navy, September, 1991), 9.

11. U.S. Navy, Intermediate Helicopter (T-34) Master Curriculum Guide (Corpus Christi: Department of the Navy, November 1991), 7.

12. U.S. Navy, Undergraduate Helicopter Flight Training Curriculum (Corpus Christi: Department of the Navy, June 1992), 7.

13. IERW Aviator Course Program of Instruction (January 1990), 7.

14. Undergraduate Helicopter Flight Training Curriculum (June 1992), 15.

15. Department of Defense Interservice Training Review Organization (ITRO), Undergraduate Helicopter Flight Training ITRO Phase I Study (Washington: ITRO, 1991), 2.

16. The Army flies several configurations of the UH-60 and the Navy flies primarily two configurations of the H-60, the SH-60B and SH-60F.

CHAPTER 2

LITERATURE REVIEW

The sources examined in my research include: several studies specifically on the UHPT consolidation issue; books, studies, research papers and theses on joint issues in general; and documents of both the Army and the Navy pertaining to their helicopter training programs. As previously stated, one of the limitations is that almost all of the material in the consolidation studies was generated by the services and thus is presented so as to support their position. A major task in collecting evidence from these sources is to carefully examine the substantiation presented for a given position and determine its validity.

There are at least four studies done over the last seven years that deal with various aspects of UHPT consolidation. While not all were concerned with only UHPT, each had significant findings that related to the issue. Yet another study is currently ongoing.

A Government Accounting Office study in 1985 looked at the Army, Navy and Air Force Undergraduate Pilot Training programs. The study focused on consolidation of the primary phase of Air Force and Navy fixed wing training because the advanced phases dealt with more specialized, service unique

training. The criteria for the study were that consolidation would have to produce dollar savings, continue to meet the pilot production requirements and not result in a reduction in the quality of training¹. One of the main differences that the GAO study pointed out between the Air Force and Navy program's syllabi was that the Navy syllabus contained more instrument training and emphasized instrument skills because they are required for all-weather operations in the fleet. The report did not recommend consolidation.

Defense Management Report 962 of September 1990 reviewed opportunities for improving the management of military training². It specifically made recommendations for improvements in helicopter pilot training by eliminating Navy fixed wing training and consolidating all DOD helicopter pilot training at the Army Aviation Center, Fort Rucker, Alabama. These two proposals are the subject of a study now being conducted (November 1992) by the Assistant Secretary of Defense for Force Management and Personnel (FM&P) and represent the issues at the heart of the consolidation discussions.

The Department of Defense Office of the Inspector General (DOD IG) issued Audit Report 92-063 entitled "Acquisition of Common Aircraft for Navy and Air Force Undergraduate Pilot Training" in March 1992³. The study is significant to this research for several reasons. It discusses in detail the Navy requirement for the fixed wing

training given to its helicopter pilots receive and addresses the Defense Management Report 962 proposal that all UHPT be consolidated at Fort Rucker. The Audit recommends that fixed wing training be eliminated and that UHPT be consolidated, but endorsements by the Assistant Secretary of Defense (FM&P) do not concur with the proposals. Instead, they call for additional study to develop more detailed information to make a decision on the proposals. Comments on the recommendations of the DOD IG Audit Report made by the Deputy Director of Defense Research and Engineering (Tactical Warfare Programs) and the Navy again highlighted the Navy's philosophy on the benefits of the instrument training that its pilots receive in the fixed wing syllabus.

Another group that has studied the consolidation issue is the Interservice Training Review Organization (ITRO). ITRO is a jointly chaired group with representatives from all the services. ITRO first studied consolidation in 1975, concluding, at that time, that it was a cost effective proposal. The most recent ITRO study was completed in 1991⁴, subsequent to the DMR 962 proposals. The ITRO study was done in two phases: Phase I looked at primarily facilities and curriculum issues; and Phase II conducted cost analysis of the options presented in Phase I. The first option was fixed wing training for Navy students, conducted by the Navy, prior to a jointly developed, all

service common core helicopter curriculum. This was to be followed by service unique helicopter Tracks at Fort Rucker. The second option eliminated fixed wing training, with only rotary wing training being conducted. Cost analysis, conducted in Phase II of the ITRO process, indicated it would not be cost effective and the study recommended not pursuing Phase III, implementation.

The above reports are the most recent examples of studies on the consolidation issue. Because the studies were conducted by many diverse organizations, at different times, with different criteria and objectives, they have contributed to the confusion and complexity of the issue. Their relevance to this research is that they discuss the critical issues of UHPT, which have a direct bearing on the common core syllabus issue. It is interesting to note that with one exception, there is no significant discussion of a requirement for maintaining the quality of training that currently exists. This, too, begs the question of what the common core syllabus would consist of and how it would or could adequately meet the needs of all the services.

The studies and documents related to the UHPT consolidation issue provide the background and historical development necessary to understanding the overall situation. The instructions and regulations of the services pertaining to the current UHPT programs are the place where the answer to the primary research question begins.

Delineation of the Army program is found in three documents. The Initial Entry Rotary Wing (IERW) Training Program of Instruction (POI) contains a breakdown of the individual tasks and training events that are conducted in the Army's UHPT program. It is arranged by event type, sequence and training time and gives a detailed description of the Core, Tracks and other advanced syllabi.

The Primary and Instrument Phase Flight Training Guides (FTG) provide the details of those portions of the syllabus. They contain a flight period outline, tasks selected for training, training objectives and other pertinent information.

The Navy's UHPT program falls under the cognizance of the Chief of Naval Air Training (CNATRA). CNATRA provides guidance for the administration of the Navy's UHPT program through the Undergraduate Helicopter Flight Training (UHFT) TH-57 Master Curriculum Guide and the UHFT Curriculum Outline. These publications contain the guidelines for implementation of the program, a breakdown of training by hours and an outline of the items that are taught or evaluated on each flight. Curriculum documents for Aviation Preflight Indoctrination, Primary Flight and Intermediate Helicopter Training contain the details of those phases of the Navy UPT program.

Safety and flying data may provide further insight on the two programs. The Army and Navy Safety Centers can

provide information on accident rates among helicopter pilots, categorized by flying-hours experience, type of aircraft, operating environment, etc. Data such as mishap factors related to training deficiencies, mishaps rates in the UHPT training environment and type and quantity of hours flown under various types of flight conditions (visual, night, instrument) may help in evaluating the programs.

Endnotes

1. U.S. General Accounting Office (GAO), "Fixed Wing Undergraduate Pilot Training Consolidation", Briefing delivered to Senate Armed Services Committee, 18 March 1985 (Washington: GAO, 1985), 4.

2. Department of Defense Inspector General, Acquisition of Common Aircraft for Navy and Air Force Undergraduate Pilot Training Audit Report Number 92-063 (Washington: DOD IG, 1992), 3.

3. Acquisition of Common Aircraft for Navy and Air Force Undergraduate Pilot Training Audit Report Number 92-063 (March 1992), i.

4. Department of Defense Interservice Training Review Organization (ITRO), Undergraduate Helicopter Pilot Training ITRO Phase II Study Cost Analysis (Washington: ITRO, 1991), 1.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of the research design is to collect, analyze and interpret data relevant to the research topic. Specifically, this research model was constructed to answer the research questions pertaining to the formulation of a consolidated UHPT program.

Collection

Data was collected from the various primary and secondary sources described in Chapter 2. Primary sources included Army and Navy instructions and publications pertaining to the administration of their respective UHPT programs. Secondary sources included the various studies conducted on the subject of consolidation.

The first step in the collection of data was to gather information to provide the background and help to develop a basic understanding of the concept of consolidation of UHPT programs. The objective of this was to identify the most prominent issues in the consolidation debate and, specifically, those issues pertinent to the formulation of a joint, consolidated syllabus. Additionally, this research helped to define the

requirements a consolidated syllabus would have to meet and where it might fit into the overall UHPT system.

The first source that was used were the studies and documents that addressed previous efforts on consolidation. The most significant of these included the Interservice Training Review Organization Phase I and II studies from August and September 1991, respectively, the Department of Defense Inspector General Audit Report from March 1992, and the Assistant Secretary of Defense (Force Management and Personnel) Memo from August 1992.

Newspaper and magazine articles that dated from the days of the earliest proposals in the mid-1970's provided a historical perspective.

Once the background and overall context of the consolidation issue was established, the next step was to collect information that dealt with the current UHPT programs. Since the focus of the consolidation discussions was the Army and Navy UHPT programs, information was collected that defined each of these programs.

The data required for an analysis of the Army's UHPT program is contained within the IERW program documents. The IERW Program of Instruction (POI) addresses both the Core and Track courses of training. The POI provides a general overview of the program as well as a description of the Primary and Instrument phases within the Core course.

Various annexes summarize flight, simulator and academic training and provide a course lesson sequence summary.

Specific guidelines for conducting Primary and Instrument training are found in the respective phase Flight Training Guides (FTG). These instructions contain data on the purpose, scope and description of training, training sequence and detailed objectives by task, condition and standard.

The initial research on the Navy's flight training program indicated that information on the entire process, not just UHPT was needed. Navy UHPT follows the Aviation Preflight Indoctrination (API) syllabus, and Primary Flight and Intermediate Helicopter fixed wing training. Since the instruction in UHPT builds upon the skills and knowledge previously learned, it was necessary to collect data on API, Primary Flight and Intermediate Helicopter Training as well. Although this study makes an assumption that UHPT can be conducted without fixed wing training, to properly analyze the current Navy program, it is necessary to understand the level of flight training with which a student enters the program. A review of the API syllabus and the Primary Flight and Helicopter Intermediate Training curriculum documents provided that information.

The primary documents used in defining the current Navy program was the UHPT Curriculum Outline and the UHPT Master Curriculum Guide. The data from these documents

provided the basis for a direct comparison of the Navy's rotary wing training program. Together, they provide a breakdown from start to finish of objectives, methods, content, training times, sequence of training, etc. for Academics and Flight Support, Simulator and Flight instruction.

Analysis

The objective of the analysis phase of the research was to evaluate the collected data. This evaluation, done by qualitative and quantitative comparison in this research model, presents facts that can then be used in the interpretation phase to reach conclusions about the research topic. The analysis phase of the research concentrates on three main areas.

First, the background data will serve to identify the pertinent issues that affect the formulation of a consolidated UHPT syllabus. The underlying goal of this analysis is to further refine the context in which the consolidated syllabus is created and would operate.

The next area encompasses the most significant portion of the analysis, which is the comparison of the current UHPT programs. Analyzing the programs based on common criteria will provide a means of identifying true areas of commonality. The criteria used for this analysis are described below.

The first criteria is to define the objectives of both programs. Objectives are both stated explicitly in UHPT documents and can be inferred from various data about the programs. This information helps in understanding the overall structure and content of each syllabus.

The second criteria, content, covers two related areas: the topics that are taught; and the quantity of each topic taught in academic/flight support, simulator and flight instruction. The analysis will look at measures such as number of hours, training days, lessons, flights, etc. dedicated to each topic of instruction.

Additional criteria used to analyze the syllabi are the pace, sequence and methods of training. Pace of training evaluates how much training is conducted over a given period of time, for example, how many flights per week in the flight phase, or an overall measure of how long the entire syllabus takes.

The sequence of the syllabus looks at the order in which the training is conducted. The arrangement of the modules (Navy) and stages (Army) provides insight into the design of the program and how subjects and types of instruction build on and support one another. This information may help to justify the type and amount of a given subject and point out ways that a syllabus seeks to achieve its objectives.

Finally, a comparison of the methods of training was done. This included the form of instruction, such as lectures, self paced study, individual one-on-one instruction, the use of civilian and military instructors and the use of dual and solo flight instruction.

Interpretation

The first step in the interpretation phase is defining the objective. This determines where a consolidated syllabus starts and what it aims to accomplish. It provides a view of where the consolidated syllabus fits in the overall UHPT concept.

In defining the objective, commonality and the question of scope--how much a consolidated syllabus should attempt to effectively teach--become the limiting factors. This issue impinges directly on advanced training. One of the assumptions was that a consolidated syllabus could provide aviators for advanced training with the same level of training as the current programs. This is necessary in order to limit the scope of the study, and not evaluate the effect on advanced training programs. In practical terms, this is also desirable because the cost to operate the aircraft used in advanced training is much greater than the cost for UHPT training aircraft.

Specifically, defining the objective will determine the skills and knowledge that the consolidated syllabus

teaches to student aviators. This represents the desired end state for the program.

The next step in the interpretation phase is to draw conclusions and make judgements about the common and unique items identified in the analysis phase. These elements form the basis of the recommended consolidated syllabus.

Common items are addressed in the same structure as in the analysis phase: content, both topic and quantity, by type of training (academic, simulator, flight); and finally, pace, sequence and method of training.

For those items initially identified as unique to either program, they are evaluated for potential inclusion in the consolidated syllabus in view of any anticipated future requirements or benefit. If they are identified as truly unique items that are necessarily part of the undergraduate phase, as opposed to the advanced phase, alternatives for accomplishing them are examined.

The end product of the research is recommended consolidated syllabi. The recommendations address the objective and content of syllabi with varying degrees of consolidation, and the rationale for that consolidation.

CHAPTER FOUR

ANALYSIS

Introduction

This chapter discusses the pertinent, consolidated related issues from previous studies and provides detailed descriptions and comparisons of the Army and Navy UHPT programs. The descriptions of the programs will include their objectives, content, pace and sequence of training, and the methods of instruction.

Previous Studies/Issues

Numerous studies and documents on the various aspects of consolidation have been produced in the past. Some studies were concerned with only UHPT and in some studies UHPT was only one of many aviation training related issues addressed. A review of a few of the most recent studies will highlight pertinent issues directly related to the formulation of a consolidated syllabus.

In February 1985, the General Accounting Office made a presentation to the U.S. Senate Armed Services Committee on the subject of Fixed Wing Undergraduate Pilot Training Consolidation.¹ The Air Force and the Navy programs were

the focus of the presentation. It is noteworthy for the way in which the issue was examined.

The presentation made three main assumptions. The first, and most important in the study, was that there had to be an opportunity for substantial cost savings by closing a training base through consolidation. Second, any consolidation of training functions had to satisfy Department of Defense pilot training requirements, and third, that it must not reduce the overall program quality.²

The presentation stated in its conclusion about the comparison of the syllabi that there were "more differences...attributed to...different operating environments and skill emphasis."³ It also noted that the Navy syllabus contained a greater quantity of instrument training because of the nature of its "all weather operations."⁴

Three additional documents, all originating in the last two years, are interrelated. They provide an overview of the current status of the issue.

The Interservice Training Review Organization (ITRO) conducted two phases of a three phase study of UHPT consolidation in 1991. Phase I was an overview of the issue that developed three options, two of which were cost analyzed in Phase II. Option 1 was to maintain the status quo. Options 2 and 3 were a joint core helicopter syllabus, with follow on service unique helicopter phases preceded by

either a no-fixed-wing or a modified-fixed-wing syllabus for Navy students. Of the issues addressed by the study, the necessity of the fixed wing training for Navy syllabus students was the most prominent issue. While the study did not make any qualitative judgements about the value of either syllabus, it did contain a section showing a task by task comparison of what each syllabus contained.

The Navy, in rebuttal, raised two main points. First, they felt the loss of fixed wing training resulted in a "loss of emphasis on independent decision making in the more structured Army program."⁵ Second, they felt the loss of fixed wing training would result in the loss of the benefit of situational awareness development from exposure to aerobatics and out-of-control flight regimes.⁶

The study did little to resolve the consolidation issue. Phase II recommended against further study (i.e. Phase III) because it determined consolidation was not cost effective.⁷

An Audit Report by the Department of Defense (DOD) Inspector General in March 1992 looked at several programs and issues in the 1989 DOD Trainer Aircraft Masterplan.⁸ Elimination of fixed wing training in the Navy UHPT program and consolidation of UHPT were again major issues because they greatly affect the decision on numbers of aircraft procured for fixed wing UPT. If UHPT fixed wing training is eliminated and UHPT consolidated, the number of aircraft

needed for UPT is greatly reduced resulting in major cost savings.

The report included findings that Navy fixed wing training was not cost effective and that consolidation of UHPT held the potential for significant cost savings. The Assistant Secretary of Defense (Force Management and Personnel) (ASD (FM&P)) did not concur with those findings, however, stating that the Audit Report compared dissimilar programs and that more thorough study of the issue was necessary.⁹

Among other things, the Navy's rebuttal to the report's findings stated that fixed wing training was an essential part of its overall instrument training objectives, necessary to meet its internal standards for instrument qualification of its pilots.¹⁰

Subsequent to the DOD IG Audit Report, the ASD(FM&P) coordinated with the Inspector General to form a group to conduct further study of consolidation. A memorandum dated August 25, 1992, tasked the group to study the issues that were raised in the Assistant Secretary's endorsements to the report. That report was not available at the time this research was conducted.

Another recent document that discusses the consolidation issue is the "Report on the Roles, Missions, and Functions of the Armed Forces of the United States" issued in February 1993. In that report, GEN Colin Powell,

Chairman of the Joint Chiefs of Staff, makes the following observations and recommendations regarding UHPT:

--Although the 1991 ITRO report held that consolidation was not cost effective, one area that might produce savings was the procurement of a common training aircraft. The Chairman stated that "continued study is warranted for both consolidation of helicopter training and development of a common training helicopter."¹¹

--As an objective, he recommended achieving a consolidated overall flight training program by the year 2000.¹²

--Near term objectives included establishing a joint service team to develop and implement a consolidation plan, exchanging instructor pilots among the service programs to develop first hand knowledge about the challenges involved, and, if cost effective, to relocate Navy, Marine Corps and Coast Guard helicopter training to Fort Rucker by the end of 1994.¹³

With these issues as background, the individual programs will now be examined.

Army UHPT

The Army UHPT program is known as the Initial Entry Rotary Wing (IERW) Aviator course. IERW is conducted for warrant and commissioned officers using only rotary wing aircraft, in contrast to the Navy program which uses fixed and rotary wing aircraft. The IERW program consists of a

Common Core portion followed by four Tracks that train pilots for specific models of aircraft (OH-58, UH-1, AH-1 and UH-60). The Common Core portion of IERW is conducted in two phases, Primary and Instrument. These two phases are the area of IERW which appear to be the most common with Navy UHPT and on which this study is focused.

Army IERW will be examined against the same criteria as Navy UHPT: objectives, content (both topics and quantity), pace, sequence and method of training.

Objectives

The objectives of the Army UHPT program are found in the purpose and scope statements in the IERW Program of Instruction (POI) publication. The purpose of the IERW Common Core syllabus is "to train initial entry aviator students in rotary wing aviator skills...for progression into the applicable follow-on aircraft system track."¹⁴ The scope of the course is "to provide basic rotary wing skills and knowledge" and "includes physical and mental skills and knowledge objectives for basic rotary wing flight maneuvers, emergency procedures, flight planning, instrument flight, safety factors and introductory aviator Survival, Evasion, Resistance and Escape (SERE) training."¹⁵

The purpose of the Primary and Instrument phases parallel the overall Common Core. The Primary phase attempts "to train IERW students for system qualification in the UH-1 helicopter"¹⁶, while the Instrument phase seeks "to

provide initial entry rotary wing instrument qualification under actual or simulated Instrument Meteorological Conditions (IMC)."¹⁷

At the next level of detail, tasks are identified that are "the minimum learning objectives required to complete this course."¹⁸ These are discussed in detail in the Flight Training Guides in Chapter 3, "Training Objectives." The training tasks are numbered and their format includes Task, Conditions, Standards, Description and Procedures. These provide the student with step-by-step guidance on each of the maneuvers found in the Common Core for both Primary and Instrument phases.¹⁹ The tasks are listed in Appendix B.

Content

Army UHPT is organized differently than the Navy UHPT program. Content information, the topics and quantity of training and instruction that make up IERW, are derived from the Program of Instruction and the Flight Training Guide publications.

The Program of Instruction (POI) contains information about the entire IERW program. This includes IERW Common Core for Army, Air Force and foreign military students (known as EURO-NATO), and the Tracks for advanced Army training.

The POI begins with a Preface page that provides basic data about each of IERW courses. POI training annexes

describe the details of IERW instruction by subject, for example, Course Orientation, Aviation Medicine, Primary Academics. etc. The instructional purpose for the annex is stated, and total hours are given by various categories. The individual POI files are listed, showing further detail, including the scope, tasks supported and instructional element that conducts the training. The POI also contains a POI File Index, and a Course Summary, which shows the number of hours of training from each annex that are conducted in the Core and each of the tracks.²⁰

The IERW Course Lesson Sequence Summary provides a sequential listing of the training days, with POI File Numbers and hours of instruction per day.²¹ The POI Files listed in the summary were cross-checked against the training annex listings to determine the exact amount and type of training conducted in a certain portion of the IERW syllabus. This is necessary since only parts of the annexes apply to certain IERW courses.

While the Program of Instruction gives an overview of the entire IERW program, detailed information on a specific portion of the syllabus is found in the Flight Training Guides (FTG). In this study the Primary and Instrument phase FTG's were examined. Flight Training Guides contain an introduction to that phase of training, the training sequence, the training objectives and supplemental information.²²

The training sequence gives a breakdown of the flight hours in the phase, along with a listing of the tasks selected for training and the outlines of the flight periods. Flight period outlines list the standard elements of every period and a breakdown of hours and specific task numbers that are trained on in that period.²³ Also included is a detailed discussion of the requirements and procedures for conducting evaluations within the phase.²⁴

The description of Training Objectives addresses in detail all of the tasks selected for training in that phase. The format is organized into five elements: Task, Condition, Standard, Description and Procedure.²⁵ It provides a step-by-step discussion of how each maneuver or task is to be performed by the student.

Supplemental information includes tasks that are classified as Supporting Skills and Knowledge and miscellaneous guidance and procedures related to the conduct of flight training.²⁶

The Primary and Instrument Phase Flight Training Guide are similar in organization and content.²⁷ The above description of the IERW program documents and organization will help to understand the information discussed in the content analysis of Army UHPT. Table 1 represents the configuration of Army IERW Core phases.

Content of the programs is defined in this study to include topics and quantity of the different types of

Table 1, Army IERW Core Phase Summary

IERW Core	
<u>Phase/Stage</u>	<u>Objective/Content</u>
Primary Stage I	Familiarization
Primary Stage II	Familiarization

Instrument Stage I	Basic and Radio Instruments, Airway Navigation
Instrument Stage II	Basic and Radio Instruments, Airway Navigation

instruction. The topic addresses the subjects dealt with in the four general areas of training (Academic and Flight Support, Simulator and Flight Training). Academic and Flight Support instruction will be addressed as one category. The distinction between the two is not significant for the purposes of this study.

The Primary and Instrument phases of the Core syllabus were examined to determine the make up of each category. From the Course Lesson Sequence Summary, individual POI Files were evaluated to identify the type of training they contained and then categorized appropriately. For simulator and flight training, topics were identified from the lists of tasks selected for each type of training.

The general training area of Academics and Flight Support covered a variety of subjects. Those subjects, categorized by the general title of the annex in which they are found, and the specific items within each Annex are listed in Appendix C. Table 2 and Appendix D summarize the IERW Core syllabus content.

Table 2. Army IERW Core Syllabus Content Summary

<u>Training Type</u>	<u>Periods</u>	<u>Hours</u>
Academic/Flight Support	-	253.0
Simulator		
Cockpit Procedure Trainer	5	7.5
Flight Simulator	20	30.0
TOTAL	25	37.5
Flight		
Primary Stage I	20	18.5
Primary Stage II	30	41.5
Instrument Stage II	20	20.0
TOTAL	70	80.0

Pace

The criteria of pace looks at measures of the quantity of instruction in a given period of time. For example, this can range from the amount of instruction in a single flight or a training day, to the overall length of the syllabus.

The training week in the IERW Core syllabus is defined as 8.5 hours per day, 42.5 hours per 5-day week.²⁸ Of the 8.5 hours, 5.5 hours are dedicated to the scheduled flight event. This time is known as Flight Training Block Time (FTBT) or Simulator Training Block Time (STBT). Evaluation blocks are designated as Flight Evaluation Block Time (FEBT) and Simulator Evaluation Block Time (SEBT).²⁹ A

Table 3. IERW Core Block Training Time

Element	Primary Flight	Instrument Simulator	Flight
Flight Commander's Brief	0.6	0.5	0.5
Instructor's Briefing	0.5	0.5	0.5
Demonstrate and Practice Tasks	3.9	3.0	4.0
Debriefing	0.5	0.5	0.5
TOTAL	5.5	4.5	5.5

typical distribution of the Flight and Simulator Training Block Time is shoown in Table 3.

The time allotted to "Demonstrate and Practice Tasks" includes the actual flight or simulator portion of the training. The objective times for these periods are 1.3 hours for Primary flights, 1.5 hours for Instrument simulators and 1.0 for Instrument flights.

The overall length of the IERW Common Core is 100 training days, or 20 weeks.³⁰ The first 10 days of the Core syllabus are dedicated to Course Orientation. The Primary phase is 50 days, with 60 flight hours (57.5 dual, 2.5 solo), and the Instrument phase is 40 days, with 30 simulator hours and 20 flight hours.³¹ The syllabus contains one flight or flight simulator per day once students begin flying on training day 11.³²

The flight training guides contain other miscellaneous guidance related to the pace of the syllabus. The Instrument FTG description of training states "students should fly daily" and "to allow for the advanced student, flight periods may be completed prior to the day indicated."³³ Although these conditions are not stipulated in the Primary FTG, the course lesson sequence summary indicates that flights are scheduled daily once students begin flying.

Sequence

The sequence of the syllabus is an evaluation of the progression of instruction by type and topic area. It is discussed here by the various stages found in the IERW Core program.

In the Primary phase, training days 1 through 10 are used to conduct inprocessing and orientation, as well as instruction on Aviation Medicine, UH-1 Radio System and

procedures, Performance Planning, Airframe Structure and five Cockpit Procedural Trainers.³⁴

Stage I of Primary Flight training occurs from Training Days (TD) 11 to 26. Instruction includes basic flight maneuvers and emergency procedures. There are no new maneuvers introduced after TD-21 and the Stage check flight is conducted on TD-26. Academics taught in Stage I cover aerodynamics and UH-1 aircraft systems.³⁵

Primary Stage II, TD-27 through TD-60 continues basic familiarization flight training with the introduction of a limited number of new maneuvers; there are no new introduced after TD-30. This Stage includes the student's first solos (TD-19, -22, -24) and finishes with the final stage check flight on TD-60.³⁶ Weather, flight rules, navigation procedures, professional development and SERE instruction is given in Stage II.

The Core Instrument phase covers TD-61 to TD-100 and is also divided into two Stages. The phase includes 20 simulator and 20 flight events. Stage I is TD-61 to TD 70 and is composed entirely of Flight Simulator events of 1.5 hours each. The simulator periods are used to teach basic instrument procedures, unusual attitudes, emergency procedures and cockpit teamwork. Academic topics in this stage are navigation procedures and equipment and radio instrument procedures.³⁷

Stage II of the Instrument phase, TD-71 to TD-100, begins with 10 additional simulator periods followed by 20 flight periods. These events teach radio instrument maneuvers and procedures, instrument approaches, flight planning and enroute navigation (airway navigation). By the end of the simulator periods, all new instrument phase maneuvers have been introduced and flight periods are used to practice maneuvers and refine instrument flying skills. The academic topics taught in this stage are instrument navigation, flight planning, aircrew communication and coordination, and terrain flight operations.³⁸

Methods

The methods of instruction criteria considers the means and personnel used to implement the syllabus. In the Army UHPT program, this is encompassed in what is known as the instructional element, which is the organization and type of instructor.

Academic and Flight Support instruction use the following methods: briefing, conference, demonstration, film, practical exercises of various kinds, programmed instruction, seminars, and television and video tape.³⁹

Simulator training is conducted in the UH-1 Cockpit Procedural Trainer and Flight Simulator devices. All flight training is conducted in the UH-1 aircraft.

Contract instructors teach all Primary and Instrument phase academics and flight instruction. With the

exception of some Primary mid-phase progress checks, all evaluation events (except simulators) are conducted by Army officer instructors.⁴⁰

Military instructors also teach the following Academic and Flight Support topics: Course Orientation, Aviation Medicine, Aircraft Systems, Cockpit Procedures, SERE, Map Interpretation and Terrain Analysis, and Professional Development.⁴¹

IERW UH-1 Track

The IERW UH-1 Track consists of Basic and Advanced Combat Skills, and a Night/Night Vision Goggle phases. A brief discussion of this track is provided for the purpose of subsequent Comparisons and Recommendations. Appendix E provides an overview of the UH-1 Track instruction.

Basic Combat Skills provides 44.0 flight hours of mission type instruction that leads toward qualification and designation as an Army aviator in the UH-1 aircraft.⁴² Training includes Cross Country Day VFR Navigation, Terrain Flight (Low Level, Contour and Nap of the Earth (NOE)), External Load and Confined Area Operations and an introduction to Multi-aircraft operations (formation).

The Advanced Combat Skills phase focuses on the aircraft employment in a tactical environment. The instruction is centered on "in-depth tactical mission planning and multi-aircraft operations." There are 13.8 flight hours in this phase.⁴³

The purpose of the Night/Night Vision Goggle phase is to qualify IERW students for night vision goggle operations under visual meteorological conditions (VMC). The phase consists of 23.5 hours of flight instruction and 1.5 of simulator instruction.⁴⁴

Navy UHPT

Navy UHPT is the rotary wing portion of the Navy's overall Undergraduate Pilot Training (UPT) program. Prerequisites for beginning the UHPT program are successful completion of the Primary and Intermediate courses, which are both conducted in the T-34C fixed wing aircraft.

Objectives

UHPT is intended to be a logical progression in the Navy's flight training program. The "objectives, disciplines and flying skills achieved by the student Naval aviator (SNA) are common throughout UPT."⁴⁵ The objective of UHPT "is to teach the skills necessary for flying rotary wing aircraft, qualify students for rotary wing and Naval Aviator designation and a standard instrument rating."⁴⁶

This main objective is supported by nine Terminal Objectives⁴⁷, which represent the broad areas of training that the program seeks to provide. These nine objectives are summarized below:

--Execution of basic familiarization flight maneuvers, under day and night visual meteorological conditions (VMC).

--Analysis and interpretation of limiting environmental factors affecting flight.

--Electronic and visual navigation in compliance with standard operating directives.

--Communication procedures, both externally and within the aircraft using visual and electronic means.

--Management of existing normal and malfunctioning aircraft systems in accordance with established procedures and limitations.

--Execution of instrument flight maneuvers.

--Conduct of day shipboard operations.

--Execution of helicopter basic tactical maneuvers.

Each terminal objective contains learning objectives. These learning objectives are more detailed, specific items that, when completed, facilitate the accomplishment of the supported terminal objective. The various terminal objectives contain between five and twenty eight learning objectives.⁴⁸

The learning objectives are further broken down by the actions, conditions and standards that lead to their completion. The actions are the tasks or performance required of the students, the conditions describe the

environment under which he must perform those actions, and the standard is the level of performance he must meet.

By completing the various training events in the syllabus, students gain the skills and knowledge required to meet the program objectives. The actions, conditions and standards contain requirements to describe procedures, recall criteria, recognize cues, make control inputs, etc. for the training items in each event.

The syllabus is organized into modules that are logical, progressive groupings or combinations of training events (flights, simulators, lectures, examinations, etc.). Each of these modules has its own objective that pertains to the area of instruction found in that module.

To summarize, the mission of Navy UHPT is to teach basic rotary wing flying skills (i.e., familiarization and instrument) leading to qualifications for rotary wing and naval aviator designations, and an instrument flight rating. This objective is supported by nine terminal objectives which are defined by actions, conditions and standards. The actions are the basis for the tasks that are found in the modules of the actual syllabus. The modules are groups of instruction of various types (flight, simulator, etc.) on related subject areas (basic familiarization skills, tactics, instrument skills, etc.).

Content

An understanding of the content of the program is necessary for further analysis. A general discussion of how the program is organized and structured will be provided to

Table 4. Navy UHPT Module Summary

<u>Module</u>	<u>Objective/Content</u>
0	Introduction/Orientation
1	Familiarization, Emergency Procedures
2	Day/Night VFR Navigation
3	Introduction to Tactics (Confined Area Landings, External Loads)
4	Basic Instruments, Emergency Procedures
5	Radio Instruments, Emergency Procedures
6	Radio Instruments, Airway Navigation (Instrument Rating Qualification)
7	Tactics (Low Level Terrain Flight, Formation, Search and Rescue Patterns, Overwater Flight, Shipboard Approaches)
8	Shipboard Landing Qualifications

help in understanding of the content. Content will then be discussed by the topics covered in each of the four general training areas (Flight Support, Academic, Simulator and Flight Training) and the quantity of each topic. A listing of all the tasks and maneuvers found in the syllabus is also provided in Appendix B.

Training of SNA's is accomplished through the completion of nine modules of instruction. The modules combine topic-related training of the four basic types and include a statement of the general objective. The modules are designed to be accomplished sequentially, in order to provide a logical flow to the training process. The module objectives are summarized in Table 4.

The Academic category of instruction includes three subjects: Aerodynamics, Engineering and Instrument Navigation.⁴⁹ These subjects are tailored to rotary wing aircraft in general and the TH-57 helicopter, flown by Navy students, in particular.

The flight support area covers the following topics: Welcome Aboard, Safety, Preflight and Cockpit Procedures, Course Rules and NATOPS Open/Closed Book Examinations and Flight Procedure Seminars (VFR Navigation, Emergency Procedures, Course Rules, Basic Instruments, Radio Instruments, Airways Navigation, Formation/External Loads/Confined Area Landings Course Rules, Low Level VFR and

Table 5. Navy UHPT Syllabus Content Summary

<u>Element</u>	<u>Periods</u>	<u>Hours</u>
Academic/ Flight Support	-	96.3
Simulator Cockpit Procedures Trainer	5	6.5
Flight Simulator	18	36.4
<u>TOTAL</u>	<u>23</u>	<u>42.9</u>
Flight Module 1	17	25.8
Module 2	5	8.3
Module 3	4	6.5
Module 4	9	14.5
Module 5	2	3.5
Module 6	17	33.0
Module 7	14	23.5
Module 8	2	1.0
<u>TOTAL</u>	<u>70</u>	<u>116.1</u>

Formation Brief, Mission Brief/Shipboard Operations, Search and Rescue Procedures and Map Interpretation).⁵⁰

Simulator training is conducted on two devices. The Cockpit Procedures Trainer (CPT) is used to familiarize students with the layout of the cockpit, teach the use of checklists, the operation of aircraft controls and systems, and provide an introduction to emergency procedures.⁵¹ The TH-57 flight simulator is used to teach Basic and Radio instrument, and Airway Navigation procedures, as well as emergency procedures and helicopter tactics.⁵²

Flight training is taught in two models of the TH-57 helicopter ("B" and "C" models)⁵³ and is divided into nine stages of training (which mirror the nine modules):

Familiarization, Operational Navigation, Night Familiarization, Transition Flight, Basic Instruments, Radio Instruments, Airways Navigation, Helicopter Tactics and Ship Qualification.⁵⁴

The training tasks or maneuvers are found in the actions, conditions and standards that define each terminal learning objective. The maneuvers and tasks are listed in Appendix B and will be discussed further in the comparison of the programs.

The quantity aspect of the content of the training is stated as time or events. Quantities are addressed by the amounts of general types of training and are summarized in Table 5. Appendix F contains a more detailed description.

Pace

Pace is a measure of the rate of training or the speed at which a student is expected to move through the syllabus. In its discussion of objectives, the Navy UHPT Curriculum Outline states "the goal of all students is to meet the...terminal objectives within the specified flight hour and calendar day limitations."⁵⁵

The Navy UHPT student training week is defined as 6 hours of instruction per day, 5 days per week for a total of

30 hours.⁵⁶ In computing that time, a formula is used that includes additional training time for each curriculum hour or event. This additional training time allows for preparation and study, briefing and debriefing, and preflight and taxi time, as applicable.⁵⁷

Another measure of the overall program pace is the Helicopter Phase Training Time, or time to train. This computation contains two elements. The first is simply the cumulative total curriculum hours for Flight, Simulator, Academic and Flight Support, and administrative time. The second element is a percentage of the curriculum time, known as additional time to train, that considers several factors: weather, unsatisfactory events and associated delays, medical groundings, and events cancelled due to instructor or equipment availability. The percentage currently used is 33.5% of total time as planned overhead.⁵⁸ Based on a curriculum time of 78.9 training days (16.0 weeks), the additional time to train is 26.4 days, which yields a total time to train of 105.3 training days or 21.4 weeks.⁵⁹

The Master Curriculum Guide for Navy UHPT contains additional guidance on the conduct of the syllabus that relates to pace, summarized below:⁶⁰

--After Module 0, academic, flight support and simulator events may be completed in sequence, one module in advance. Instrument simulator events must be completed

before their corresponding flight event and commanding officer approval is required to fly an aircraft period out of block.

--Students are limited to one flight per day in the familiarization stage until FAM-9, and then are allowed to fly two flights per day. In the basic instrument stage, students may fly two flights per day after BI-4 (Simulator).

--Student workday is limited to 12 hours from the beginning of the first event or briefing, until the completion of the last event or debriefing.

--Students scheduled for more than one event in a day shall normally disembark from the aircraft, be given the required debrief and an adequate rest period before beginning the next event. Exceptions are made for three specific combinations of flights and all Helicopter Tactics stage flights. Those may only be flown together when properly briefed beforehand.

Sequence

Sequence examines the progression by type and topic of training within the structure of the syllabus. As already addressed, the Navy syllabus is arranged in modules that are comprised of the various types of instruction. In general terms, the sequence of instruction in each module is arranged so that Academic and Flight Support instruction precede the beginning of a new stage of flight events. Cockpit Procedures Trainer events are all conducted in

Module 1 and simulator events are required to be completed before corresponding flight events, as noted above.

Refer to Table 4 for a summary of the sequence by modules.⁶¹

The sequence of solo and night flights should be noted at this point. The first two solos occur in Module 1. The first night flight is conducted in Module 2. Module 6 contains two Airway Navigation solos and Helicopter Tactics solos are flown in Module 7.⁶²

Method

This criteria addresses various means used to implement the syllabus. It includes both the format of the instruction (lectures, self-study, etc.) and the personnel who conduct the instruction.

The Navy UHFT Curriculum Outline "Course Data" section lists the primary instructional methods as lectures, self and group paced academics and flight tutorials.⁶³ The flight and simulator stages use flight tutorial instruction. The Academics phase includes both self study and lecture methods and Flight Support consists of almost entirely lectures.

In Navy UHPT, civilian instructors are only used in simulator training. Military instructors conduct lectures, briefings and all flight instruction and evaluations.

Navy Non-UHPT Training

This is defined as the training Navy syllabus students receive before they enter UHPT, specifically, Aviation Preflight Indoctrination, Primary Flight Training and Intermediate Helicopter Training. The programs are not discussed in depth here, but a summary of their content is found in Appendix G. This information will be used in formulating conclusions and recommendations in Chapter 5.

Comparison

This section compares the Army and Navy UHPT programs based on the five criteria used in the analysis of the programs.

Objective

The overall objective of the Navy program as stated in its Master Curriculum Guide is to teach the skills necessary for rotary wing and standard instrument qualifications. Army IERW training teaches "basic rotary wing skills and knowledge". At this level, the two programs have the same objectives. Indeed, both programs teach basic rotary wing familiarization flight maneuvers, emergency procedures and instrument flight maneuvers and rating qualification.

The objectives of the programs differ in two main areas. The Army program teaches basic Survival, Evasion, Resistance and Escape (SERE) skills at this level. Navy

students receive general survival training in Aviation Preflight Indoctrination but receive their SERE instruction during their advanced training.

Second, the Army does not teach Shipboard Operations at all, and its tactical or combat skill training is found in its tracks or advanced training.

In summary, there is a great deal of commonality in the objectives of the two programs. Both contain the objectives of teaching three basic areas of skills: Familiarization and Instrument maneuvers, and Emergency Procedures.

Content

Content is considered by both topic and quantity of training, for Academic and Flight Support, Simulator and Flight training.

The areas of Academic and Flight Support instruction will be addressed as one topic since the distinction between the two appears to be only a somewhat vague classification of the subject. Neither program offers a clear definition of the categories. In the Navy program the Flight Support topics are categorized separately and are generally procedure related. The distinction is less clear in the Army program.

Both programs begin with an administration and orientation period. Aircraft systems, theory and operation are among the subjects taught early in the syllabus. Both

programs include simulator training on emergency and cockpit procedures prior to commencing flights. Although there are some differences in the specific maneuvers, the majority of instruction focuses on the areas of Familiarization, and Basic and Radio instrument maneuvers and procedures, including communications.

Subjects unique to the two programs parallel the discussion of objectives above. The major differences are SERE and Aviation Medicine taught in the Army program (the Navy teaches Aviation Physiology in Aviation Preflight Indoctrination) and the Tactics, Shipboard Operations and overwater Search and Rescue procedures that the Navy teaches.

The devices used for Simulator Training provide an additional point of comparison of the programs. Both Cockpit Procedural Trainers (CPT) are fixed base (non-motion), non-visual simulators. The flight simulators are both motion-based devices, but the Navy's has a visual capability.

Both services teach the same subjects in their simulator phases: Cockpit and Emergency Procedures in the CPT's, and Basic and Radio Instrument, and Airway Navigation procedures in the flight simulators. Additionally, the Navy teaches SAR procedures and Shipboard instrument approaches in the Helicopter Tactics phase in the TH-57 flight simulator.

The comparison of the Flight phase of instruction is made by looking at the stages and modules as previously discussed. A comparison is made of the specific training tasks found in each program in Appendix B.

The common instruction in the flight phase parallels that found in the other areas: Familiarization, Emergency Procedures, Basic and Radio Instruments, and Airway or Enroute Navigation. In addition, the IERW Core teaches Confined Area Landings (CAL) in the Primary phase. Navy students receive CAL instruction in the Helicopter Tactics module.

As noted in other types of training, most of the service unique items are found in the Navy syllabus. In the Flight phase these include Day and Night VFR (Operational) Navigation, Transition Flights,⁶⁴ Helicopter Tactics (tactical approaches, low level VFR navigation, formation, external loads, confined area landings, night operations and search and rescue patterns) and Shipboard Qualifications.

Night and solo flights are two additional major differences in the programs. While Army students do not receive any night flight training in the IERW Core syllabus, Navy students are required to receive a minimum of 10 hours of night flight time during UHPT. These hours are spread out over the entire syllabus consisting of 7 flights in 5 subject areas: Operational Navigation, Night

Familiarization, Basic Instruments, Radio Instruments and Helicopter Tactics.

In the area of solo flights, Army students receive one supervised solo⁶⁶ and two true solos for a total of 2.5 hours. These are all completed in the Core Primary phase of training. Navy students fly seven solo flights for a total of 10.1 hours. There are two solo flights each in the Familiarization, Operational Navigation and Airway Navigation modules and one in the tactics module.

A comparison of the tasks and flight maneuvers is found in Appendix B. There is a very high level of commonality between the programs in the Familiarization, and Basic and Radio Instrument areas. Additionally, this appendix identifies those areas of tactical instruction the

Table 6. Syllabi Content Summary

<u>Training Type</u>	<u>Army IERW Core (Hours)</u>	<u>Navy UHPT (Hours)</u>
Academic	197.0	53.8
Flight Support	56.0	42.5
Simulator	40.5	42.9
Flight	80.0	116.1

Table 7. Navy Non-UHPT Training Applicable to Consolidated Syllabus Consideration

Training Type	API	PRI	INT	TOTAL
Academic	106.0	77.8	-	183.8
Flight Support	-	9.0	7.0	16.0
Simulator	-	20.8	10.4	31.2
Flight	-	18.5	26.0	44.5

Key: API Aviation Preflight Indoctrination
PRI Primary Flight Training
INT Intermediate Helicopter Training

Table 8. Syllabi Academic/Flight Support Comparison, including Navy Non-UHPT

Training Type	Army IERW Core	Navy UHPT and Non-UHPT*
Academic	197.0	237.6
Flight Support	56.0	58.5

* Non-UHPT applicable to rotary wing training.

programs have in common, which will be discussed further in Chapter 5.

In summary, the flight stage contains similar instruction in the basic flight skills areas (Familiarization, Basic and Radio Instruments, and Airway Navigation). The Navy UHPT syllabus has more tactically and

mission oriented training, more solo flights than IERW Core and includes several night flights that are not found at all in the IERW Core.

Quantity comparisons can be made in both general and specific terms. Tables 6, 7 and 8 provide summaries of syllabus content for IERW, Navy UHPT and Navy Non-UHPT.

The greatest disparity in the number of hours is found in Academic and Flight Support instruction. Navy students receive the bulk of their Academic and Flight Support instruction during Aviation Preflight Indoctrination and fixed wing phases of training, prior to UHPT.

A comparison of the number of simulator and flight events shows that the two programs are about equal. The Army syllabus has 95 total events, which includes 25 simulator events (5 CPT's, 20 flight simulator) and 70 flight events (50 Primary, 20 Instrument). The Navy syllabus has 93 total events, broken down as 23 simulator events (5 CPT's, 18 flight simulator) and 70 flight events, of which 23 are instrument events.

Pace

Pace of the programs looked at the volume of instruction over a given period of time. Both programs are based on a five day training week, with the Army training day designed for 8.5 hours and the Navy's 6.0 hours. In the Army's flight and simulator training days, 5.5 of those 8.5 hours are allotted to flight or simulator block training

time. Of that block training time, approximately 3.5 hours are for instructor briefing and the conduct of the flight. During instructor briefing time, much of the instruction on individual flight maneuvers is conducted. In the Navy syllabus, flight maneuver training is primarily conducted in flight support events in a group classroom setting. This difference in techniques accounts for the difference in training day times. Total training time for the two programs is roughly comparable: 100 days/20 weeks for Army IERW Core and 105.3 days/21.4 weeks for the Navy.

There are two important facts to note about total training time. First, Navy students have received a significant amount of training prior to beginning UHPT. Much of this training is what Army students receive in their Academic and Flight Support training in the IERW Core syllabus. Taking into account only the Navy UHPT in comparison to IERW, the Navy syllabus provides 45% more flight time in only about 5% more time. While this may appear to be a very significant measure of the efficiency of the two programs, it must be remembered, as noted above, that a precise comparison on these terms is not possible because Navy UHPT is the second phase of instruction Navy students receive (following fixed wing UPT), as opposed to IERW which is the initial phase of Army flight training.

Finally, the two syllabi accommodate for delays in training differently. In the computation of Total Training

Time for Navy UHPT, a factor of 33.5% of planned time is added to allow for various types of delays. The Army IERW syllabus is structured with events scheduled on each of the 100 training days. The objective flight time is an average of 1.3 hours per flight period. Instructors attempt to fly more when they can to insure that students accrue the required total amount of flight time. Additionally, the Army stages include numerous flight periods in the latter portions of the stages during which no new maneuvers are introduced. These "practice/review" flight periods are used to build up student flight hours to the required level, while refining the skills already introduced.

Sequence

The programs share much in common regarding the sequence of instruction, with some notable differences. In the areas where the programs have the most in common, Familiarization, and Basic and Radio instruments, sequence is virtually the same. Both programs begin with Cockpit and Emergency Procedures simulator training, along with Aerodynamics and Aircraft Systems academic instruction early in the syllabus. The flight phase sequence is Familiarization, Basic Instrument, Radio Instrument and Airway Navigation.

There are differences in the way the instrument phases of training are conducted. Army students begin their instrument training after accumulating 60 flight hours.

They complete all 20 instrument phase simulator events before beginning the 30-flight instrument phase. In contrast, Navy students have 40.6 flight hours when they begin their instrument training, and the simulators and flights are more integrated in the overall instrument phase. Basic Instrument simulators are followed by Transition Flights and then the BI flights. The purpose of the Transition Flights is to reorient the student to flying the aircraft after the simulator stage. The next segment contains RI simulators, Transition Flights and then RI flights. Finally, the last part of instrument training in Navy UHPT is Airway Navigation simulators and flights.

Emergency procedure instruction in the flight phase is an important part of both syllabi and they are handled in a similar manner. Emergency procedures are introduced early in the flight syllabi and continue to be introduced and practiced throughout the remaining flights.

The number of solo flights has already been discussed. Although Navy students fly more solos, Army students complete their first solo event, a supervised solo, at Flight Period 11, with 10.5 flight hours. Navy students complete their first solo at FAM 13, with approximately 16.7 flight hours.

The majority of the areas that are unique to the Navy syllabus, the mission and tactics related instruction, take place after FAM, BI, RI and AN phases are completed.

Methods

Instructional methods are essentially the same for both programs. The delineation of the methods used for classroom instruction in Academic and Flight Support in IERW is more detailed than that used by the Navy. The codes provided in the POI are used to identify the amount of each type of instruction on each subject in the POI files found in the training annexes. The Navy syllabus classifies its instruction in these areas as lectures and self or group paced academics.

The only substantive difference in the instructional methods is the use of more self paced instruction by the Navy.

There is a noteworthy difference, however, in the types of instructors employed in the programs. The Army syllabus uses contract instructors (non-DOD civilians) to a much greater extent than does the Navy. Contract instructors are used in every phase and in almost every type of instruction in the IERW program. The main exception is that Army instructors are used for the vast majority of evaluation flights. Navy UHPT uses all military instructors except for simulator instruction, where contract instructors are employed.

Tactical Training Areas

Comparison of the tactical training in the Army UH-1 Track and the Navy UHPT Helicopter Tactics (HTAC) and

Operational Navigation (ON) areas reveals a general level of commonality. Multiaircraft Operations (Formation), Terrain Flight (low level), Confined Area and External Load Operations, Night Familiarization flight and Day VFR Cross Country navigation are all general areas of commonality.

Army unique areas are Nap of the Earth (NOE) and Contour flight, and Night Vision Goggle training. Overwater instrument training, Search and Rescue (SAR) patterns and Shipboard qualifications are unique to the Navy syllabus. Additionally, the Army Track syllabus contains 20.6 night flight hours that support the Night/NVG training.

Safety and Attrition

Safety and attrition data were not examined in depth for this study. By inspection, the rates in these two areas are commensurate for the two programs.

Endnotes

1. U.S. General Accounting Office, "Fixed Wing Undergraduate Pilot Training Consolidation, briefing to Senate Armed Services Committee, 18 March 1985, 1.
2. Ibid., 7.
3. Ibid., 26.
4. Ibid., 27.
5. Interservice Training Review Organization (ITRO), UHPT Consolidation Study Phase II Cost Analysis (Washington: ITRO, September 1991), 2.
6. Ibid., 3.
7. Ibid., 4.
8. Department of Defense Inspector General, Acquisition of Common Aircraft for Navy and Air Force Undergraduate Pilot Training Audit Report Number 92-063 (Washington: Department of Defense, 27 March 1992), i.
9. Ibid., 65.
10. Ibid., 106.
11. GEN Colin L. Powell, Report on the Roles, Missions, and Functions of the Armed Forces of the United States (Washington: Department of Defense, February 1993), III-18.
12. Ibid., III-18.
13. Ibid., III-18.
14. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course Program of Instruction (Fort Rucker: Department of the Army, January 1990), 5.
15. Ibid., 5.
16. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course Primary Phase Flight Training Guide (Fort Rucker: Department of the Army, July 1991), 3.
17. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course Instrument Phase Flight Training Guide (Fort Rucker: Department of the Army, March 1992), 3.

18. Initial Entry Rotary Wing (IERW) Aviator Course Core Primary Phase Flight Training Guide (July 1991), 35.
19. Initial Entry Rotary Wing (IERW) Aviator Course Core Instrument Phase Flight Training Guide (March 1992), 9;
and Initial Entry Rotary Wing (IERW) Aviator Course Core Primary Phase Flight Training Guide (July 1991), 36.
20. Initial Entry Rotary Wing (IERW) Aviator Course Program of Instruction (January 1990), 17.
21. Ibid., 186.
22. Initial Entry Rotary Wing (IERW) Aviator Course Core Primary Phase Flight Training Guide July 1991), 1.
23. Ibid., 13.
24. Ibid., 25.
25. Ibid., 35.
26. Ibid., 127.
27. Initial Entry Rotary Wing (IERW) Aviator Course Core Instrument Phase Flight Training Guide (March 1992), 1.
28. Initial Entry Rotary Wing (IERW) Aviator Course Program of Instruction (January 1990), 23.
29. Ibid., 23.
30. Ibid., 6.
31. Ibid., 22.
32. Ibid., 186.
33. Initial Entry rotary Wing (IERW) Aviator Course Core Instrument Phase (March 1992), 3.
34. Initial Entry Rotary wing (IERW) Aviator Course Program of Instruction (January 1990), 186.
35. Initial Entry Rotary Wing (IERW) Aviator Course Core Primary Phase Flight Training Guide (July 1991), 13.
36. Ibid., 13.
37. Initial Entry Rotary Wing (IERW) Aviator Course Core Instrument Phase (March 1992), 11.

38. Ibid., 11.
39. Initial Entry Rotary Wing (IERW) Aviator Course Program of Instruction (January 1990), 24.
40. Ibid., 42.
41. Ibid., 25.
42. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course UH-1 Track Basic Combat Skills Flight Training Guide (Fort Rucker: Department of the Army, October 1990), 13.
43. U.S. Army, Initial Entry rotary Wing (IERW) Aviator Course UH-1 Track Advanced Combat Skills Flight Training Guide (Fort Rucker: Department of the Army, July 1992), 11.
44. U.S. Army, Initial Entry Rotary Wing (IERW) Aviator Course UH-1 Track Night/Night Vision Goggle Phase Flight Training Guide (Fort Rucker: Department of the Army, May 1992), 3.
45. U.S. Navy, Undergraduate Helicopter Flight Training Curriculum (Corpus Christi: Department of the Navy, June 1992), 15.
46. Ibid., 15. A standard instrument rating is the initial level of qualification Naval Aviators can achieve. It represents the minimum qualification to pilot Naval aircraft in Instrument Meteorological Conditions (IMC).
47. Ibid., 15.
48. Ibid., 17.
49. U.S. Navy, Undergraduate Helicopter Flight Training (TH-57) Master Curriculum Guide (Corpus Christi: Department of the Navy, May 1992), 9.
50. Ibid., 10.
51. Ibid., 17.
52. Ibid., 9.
53. Ibid., 8.
54. Ibid., 9.

55. Undergraduate Helicopter Flight Training Curriculum (June 1992), 15.

56. Ibid., 9.

57. Ibid., 8.

58. Ibid., 9.

59. Ibid., 9.

60. Undergraduate Helicopter Flight Training (TH-57) Master Curriculum Guide (May 1992), 3.

61. Ibid., 11.

62. Ibid., 11.

63. Undergraduate Helicopter Flight Training Curriculum (June 1992), 3.

64. Transition flights are used following Basic and Radio Instrument blocks of simulator training. After a simulator block of instruction, students receive one or two Transition flights to reorient them to flying the aircraft. Depending on the point in the syllabus where they occur, these Transition flights may also serve as a safe-for-solo check flight for a subsequent solo flight event.

65. A supervised solo is a flight event in which an instructor and student begin a flight together and after an initial period of flight instruction, the instructor is replaced by another student. The two students then complete a short "solo" flight in the practice pattern. A true "solo" event differs in that two students conduct an entire flight, from start to shutdown, by themselves, in accordance with the flight period outline for that event.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The objective of the study was to identify how a consolidated syllabus might be formulated from the two programs that currently exist. This chapter will first discuss conclusions reached from the analysis of the two programs and then provide recommendations for joint, consolidated syllabi.

Conclusions

There were four main conclusions developed during this study. The most important of these is that there is sufficient commonality between the two programs to formulate a consolidated core syllabus. This conclusion is supported by commonality in objectives, content, and tasks and maneuvers. The objective of the syllabus would be to teach basic helicopter Familiarization maneuvers (takeoff, hovering, landing, straight and level flight, climbs and descents, etc.), Basic and Radio Instrument maneuvers and procedures, and Airway Navigation.

While the study assumed that prior fixed wing training was not required in order to conduct UHPT, it is

apparent that if fixed wing training is eliminated, the hours lost would have a significant effect on Navy UHPT, as well as later advanced training. In the absence of further study on the validity of fixed wing training for Navy syllabus helicopter pilots, there would have to be compensation in rotary wing training hours for all or some of the lost fixed wing hours if SNA's were to be instrument rated, designated, and proceed to advanced training upon UHPT completion. This is apparent from two observations.

First, the 92 flight hours that students receive in UPT represent 45% of the total training time for Navy UHPT graduates. An outright elimination of those hours would greatly impact skill and experience levels for students entering advanced training and ultimately, their first operational assignments.

Moreover, the Navy syllabus teaches a greater variety of tasks and contains about 40% more flight hours in its rotary wing training in only five more training days than the Army syllabus. This is made possible because UHPT training builds on the foundation of skills and knowledge that students receive in UPT.

Based on the assumption that the current programs meet the service's needs for helicopter pilots, another conclusion reached is that there are significant differences in the missions and operating environments of each service. If the programs provide the skills needed to perform the

missions of that service, in a given environment, then the emphasis on certain skills within each program indicates that the missions and environments are different.

Finally, differing terminology, organization and structure make absolute comparisons difficult. The significant areas of commonality in substance indicated above are obscured by the differences in terminology and format.

Recommendations

The three syllabi recommendations offered here can be considered as progressive steps towards a maximum level of consolidation, moving from lesser to greater degrees of consolidation and jointness. The second and third recommendations depart from the delimitation that syllabi proposals should have no impact on advanced areas of training.

Indoctrination and Orientation

The first recommendation is to develop a consolidated Indoctrination and Orientation syllabus that would be used with each of the three recommended syllabi. This portion of the program would teach the basic, general Academic and Flight Support topics, for example, Aerodynamics, Engineering, Navigation, Meteorology, Aviation Medicine and Physiology, Survival and Physical Fitness training. Service unique items such as Navy UHPT Water

Survival and Swim training could be conducted as part of the services' current training programs.

Syllabus 1

Syllabus 1 is a "minimum core" syllabus built around those areas in which the programs have the greatest commonality. They are Familiarization, Basic and Radio Instruments, and Airway Navigation. Service unique training would be accommodated through separate units of instruction similar to the modules or stages now in use. Each service would teach its unique items according to the standardized guidelines of a consolidated program. The overall types, topics and quantities of training would remain largely the same as the current programs.

The objective of Syllabus 1 would be to teach basic rotary wing Familiarization and Instrument skills to prepare students for additional rotary wing training.

The content of the syllabus would be divided into topic and quantity elements, by the types of training involved. Academic and Flight Support instruction would include Aircraft Systems, and Preflight, Emergency and Flight procedures. Aircraft Systems would deal with the specific aircraft being flown in the syllabus, as distinct from the general Aerodynamic and Engineering instruction in the Indoctrination phase Academic instruction. Flight procedures would teach the specific steps and techniques to perform the maneuvers conducted in the flight stage.

Simulator instruction would begin with Cockpit and Emergency procedures in a CPT, in essentially the same manner as currently exists. Flight simulators would be used for Basic and Radio Instrument, and Airway Navigation instruction. The Flight phase of training would parallel the current programs with Familiarization, Basic and Radio Instruments, and Airway Navigation.

Recommendations for quantity of instruction will focus on Simulator and Flight phases. The amount of Academic and Flight Support instruction would be dependent on several factors. It would be tailored to the type of aircraft used, the specific maneuvers selected for training and the amount of Academic instruction received during an Indoctrination or Orientation syllabus.

Quantity of instruction in the flight and simulator phases would be approximately equivalent to the current programs. The quantities in the Core portion of the syllabus represent the lowest common amount of hours of instruction between the programs. Service unique elements make up the difference between the proposed Core and the present individual service levels of instruction.

The syllabus also compensates for the loss of hours due to the elimination of Navy fixed wing training. The computation of those additional hours is based on the assumption that for a given amount of instruction on a skill, a percentage of the time is spent learning the

procedure in the specific aircraft type and the remaining time builds proficiency in that skill. Since the hours being carried over from Primary Flight and Intermediate Helicopter Training (fixed wing training) teach skills already taught in UHPT, it is not necessary to make a one-for-one compensation for the entire number of hours lost in the elimination of fixed wing training. For these computations, the study assumes that 20% of the time is devoted to learning the skill and 80% to developing proficiency. (This method will be used for Syllabi 2 and 3 also.)

Core CPT instruction on Cockpit and Emergency Procedures would consist of five and one events respectively, for a total of 7.5 hours of training. Basic and Radio Instruments and Airway Navigation taught in the flight simulator would consist of a total of approximately 30 events and 30.0 simulator hours. A Navy unique simulator module consisting of 1.5 hours of CP/EP training, 1.2 hours of BI/RI/AN and 2.6 hours of Helicopter Tactics would bring Navy students up to their current level of training in UHPT.

In the Core Flight phase of training, the Familiarization stage would consist of approximately 20 events and 25.0 hours of instruction. The Basic and Radio Instrument and Airway Navigation stages would be a total of approximately 20 flights and 20.0 hours each in length.

In addition to the Core, both services would have service unique instruction. An Army unique module or stage would provide 35.0 hours additional Familiarization training to maintain the current number of hours. Navy unique Flight training would include 22.0 hours of BI/RI/AN, 6.3 hours of Operational Navigation, 2.0 hours of Night Familiarization, 9.0 hours of Transition flights, 30.0 hours of Helicopter Tactics and 1.0 hours for Shipboard Qualifications. To compensate for hours lost by eliminating fixed wing training, an additional block of Navy only training is included. Syllabus 1 is summarized in Table 9.

The Pace of the syllabus remains substantially the same as the current programs since the amount of time allotted in each syllabus to completing daily flight events is roughly equivalent. The additional time now in the Army FTBT and STBT is accommodated for by providing flight procedure instruction primarily through group or classroom methods.

While there is a significant difference in the type of instructors used in the current programs, the choice of military or civilian contract instructors would not affect the content or implementation of a consolidated syllabus. However, this issue has broader implications for consolidation as a whole and additional study of the cost effectiveness and relative benefits of both methods is necessary.

Sequence of the training would follow the arrangements presently in use. Academic, and where utilized, simulator training, would precede flight training. One difference is that the Army instrument phase conducts all simulator events before beginning any aircraft events. The Navy syllabus uses a sequence of simulator-then-flight events in the separate BI, RI and AN areas. This remains an area for further study to determine any difference in relative effectiveness. The recommendation is to utilize the simulator-then-flight sequence in these areas. This will reinforce the skills by teaching them in the aircraft as soon as possible after introduction in the simulator, and to minimize the student's time out of the aircraft.

The sequence in the flight stage parallels that currently in use for the common areas taught in the proposed Core: FAM, BI, RI and AN. All service unique training follows the Core instruction. As already indicated, service unique training would be handled through a method similar to the stages or modules the syllabi now employ. Service unique training topics for Syllabus 1 are identified in Table 9.

Since Army UHPT (IERW Core) consists of only FAM, BI, RI and AN instruction, any additional training would duplicate the content of the Tracks. Syllabus 1 represents the maximum amount of consolidation that could be affected

Table 9. Syllabus 1

Element	Simulator		Flight	
	Topic	Hours	Topic	Hours
Core	CP/EP	7.5	FAM	25.0
	BI/RI/AN	30.0	BI/RI/AN	20.0
<hr/>				
Army	-	-	FAM	35.0
<hr/>				
Navy	CP/EP	1.5	BI/RI/AN	22.0
	BI/RI/AN	1.2	ON	6.3
	HTAC	2.6	NF	2.0
			TF	9.0
			HTAC	30.0
			SQ	1.0
<hr/>				
Navy Additional	BI/RI/AN	25.1	FAM	20.0
			BI/RI/AN	30.0
			ON	5.1
			NF	2.4
			HTAC	9.3
(Represents 80% of Primary Flight and Intermediate Helicopter flight and simulator hours.)				
<hr/>				
Key:	AN	Airway Navigation		
	BI	Basic Instrument		
	CP	Cockpit Procedures		
	EP	Emergency Procedures		
	FAM	Familiarization		
	HTAC	Helicopter Tactics		
	ON	Operational Navigation		
	NF	Night Familiarization		
	SQ	Shipboard Qualification		
	TF	Transition Flight		

without modifying the delimitation that a consolidated syllabus should not impact advanced training phases.

Syllabus 2

This alternative would affect the Army tracks by including in the proposed Core syllabus those items that are common with items taught in the Navy UHPT Helicopter Tactics, Operational Navigation and Night Familiarization modules. A possible impact of this is that the amount of training moved to the Core syllabus may be satisfactory to meet the Army's standards in that area. In that case, the advanced Tracks could be shortened. A second possibility is the Tracks could be revised to teach more advanced skills, or basic skills in greater quantity, by building upon those skills learned in the core.

The objective of this syllabus is instruction in basic rotary wing Familiarization and Instrument maneuvers, basic Tactical flight maneuvers, Operational (VFR Cross Country) Navigation, and an introduction to Night Operations. Additional training areas outside of this scope are taught through service unique units.

Changes in content from Syllabus 1 reflect the addition of tactical tasks and objectives. The topics of Academic and Flight Support training are the same as Syllabus 1, with the addition of procedures training for the selected Tactics, Operational Navigation and Night Familiarization tasks. The tasks for the tactics portion of

Table 10. Syllabus 2

Element	Simulator		Flight	
	Topic	Hours	Topic	Hours
Core	CP/EP	7.5	FAM	25.0
	BI/RI/AN	30.0	BI/RI/AN	20.0
* Formation, Confined Area Operations, TERF L/L			ON	6.3
			HTAC*	20.5
			NF	2.0
Army	N/NVG	1.5	FAM	35.0
			ON	3.5
			TERF L/L	15.4
			NOE	13.5
			MULTI-A/C	7.3
			N/NVG	21.0
Navy	CP/EP	1.5	BI/RI/AN	22.0
	BI/RI/AN	1.2	TF	9.0
	HTAC	2.6	HTAC**	9.5
** Night Tactical Approaches, SAR Patterns, Shipboard Approaches			SQ	1.0

Additional	BI/RI/AN	25.1	FAM	20.0
			BI/RI/AN	30.0
	(Represents 80% of Primary Flight and Intermediate Helicopter flight and simulator hours.)		ON	5.1
			NF	2.4
			HTAC	9.3

Key:				
AN	Airway Navigation			
BI	Basic Instruments			
CP	Cockpit Procedures			
EP	Emergency Procedures			
FAM	Familiarization			
HTAC	Helicopter Tactics			
MULTI	Multiaircraft (Formation)			
A/C				
NF	Night Familiarization			
NOE	Nap of the Earth			
N/NVG	Night/Night Vision Goggle			
ON	Operational Navigation			
SQ	Shipboard Qualifications			
TERF	Terrain Flight, Low Level			
L/L				

the instruction include formation flight, tactical approaches, low level navigation, confined area landings and external load operations.

The proposed Core simulator training remains unchanged. The flight stage would include the Tactical, Operational Navigation and Night Familiarizations areas listed above. The Core event and hour quantities for all simulator and the FAM, BI, RI and AN flight areas remain as indicated in Syllabus 1.

The major difference from Syllabus 1 in the Core is the inclusion of additional common instruction. There is 20.5 hours of flight instruction in formation, tactical approaches, low level navigation, confined area landings and external load operations. The Operational, or Day VFR, Navigation phase consists of 6.3 hours of flight instruction. Night Familiarization training is 2 events for a total of 2.0 flight hours.

Army and Navy service unique training for Syllabus 2 is specified in Table 10, which gives an overview of the entire Syllabus 2.

Syllabus 3

Syllabus 3 represents the greatest degree of consolidation of the three proposals. It incorporates the elements that support a higher level of service interoperability. For example, it provides introductory Night Vision Goggle (NVG) training to Navy students and

Table 11. Syllabus 3

Element	Simulator		Flight	
	Topic	Hours	Topic	Hours
Core	CP/EP	10.0	FAM	45.0
	BI/RI/AN	30.0	BI/RI/AN	30.0
	N/NVG	2.6	ON	10.0
	HTAC*	2.6	NF	5.0
			HTAC**	35.0
			N/NVG	2.5
			SQ	1.0
Army	-	-	FAM	15.0
			TERF L/L	7.0
			NOE	13.5
			MULTI-	5.0
			A/C	
			N/NVG	18.5
Navy	BI/RI/AN	25.1	BI/RI/AN	40.0
Key:				
AN	Airway Navigation			
BI	Basic Instruments			
CP	Cockpit Procedures			
EP	Emergency Procedures			
FAM	Familiarization			
HTAC	Helicopter Tactics			
MULTI	Multiaircraft Operations			
A/C				
NF	Night Familiarization			
N/NVG	Night/Night Vision Goggle			
NOE	Nap of the Earth			
ON	Operational Navigation			
SQ	Shipboard Qualifications			
TERF	Terrain Flight, Low Level			
L/L				
*	SAR Patterns, Shipboard Approaches			
**	Formation Terrain Flight Low Level, Confined Area Operations, External Loads, Night Tactical Approaches, SAR Patterns, Shipboard Approaches			

Shipboard Qualifications for Army students. In a down-sized military a broader range of skills provides greater flexibility. A small number of Naval helicopter pilots have already received NVG training and Army helicopters have operated to a limited extent from Navy ships for several years. The recent proposal for establishment of a Joint Search and Rescue element is a further example of how common skills may enhance operational capabilities.

This proposal maximizes the common Core instruction and still recognizes the requirements for service unique training that support valid mission and operational environment differences. Training to meet those needs is accommodated through service unique training elements similar to those in the other proposals. Syllabus 3 is summarized in Table 11.

Areas for Further Study

Some areas of research were identified as being beyond the scope of this study. Three areas with potential for further study, the definition of baseline helicopter pilot skills, training structure and organization, and safety and attrition data, are briefly described below.

Helicopter Pilot Training Requirements

A fundamental problem in achieving consolidation is reconciling the requirements of the different missions of the services and the objectives that independent training

programs seek to accomplish. The first step in pursuing effective consolidation should be to conduct a definitive front end analysis of the projected helicopter missions and projected operating environments of each of the services. From this analysis, the basic level of skills and knowledge required of any military helicopter pilot can be identified, as well as those skills and knowledge necessary to meet service unique requirements. Once all these requirements have been identified, they can be used to create an effective consolidated UHPT program.

Training Structure and Organization

The existence of standardized training terminology, structure and organization within the Department of Defense would greatly enhance current and future consolidation efforts. Standardization would facilitate accurate comparison of training programs to determine the initial feasibility of consolidation. It would improve the ability to modify programs as requirements change in the future. Standardization would result in efficiencies of operation and promote greater interoperability among the services. Studies should be conducted to identify those elements, such as terminology, procedures and organization, that would promote standardization.

Safety and Attrition Data

A detailed analysis of safety and attrition data is beyond the scope of this study for two reasons. First, in both cases the data is collected and maintained in different formats. This disparity requires extensive analysis and organization of the data to make accurate comparisons.

Second, direct comparison of data in either category is difficult because of the nature of the programs. For example, comparing safety mishap rates for Army IERW and Navy UHPT would be inequitable because Navy students begin their UHPT training with 96 flight hours, and presumably a greater level of experience than Army students starting IERW. A comparison of attrition data is similarly limited due to the difference in experience of the students in each of the programs.

For the reasons indicated, further study was not pursued in these areas, however, research on these topics may produce useful insight on the resolution of the consolidation issue.

APPENDIX A

GLOSSARY

Advanced Training. Training received after the undergraduate level, i.e., IERW Tracks for the Army and Fleet Replacement Squadrons for the Navy. This training concentrates on mission type skills.

Airway Navigation (AN). Flight training conducted in the airway system that is defined by position relative to electronic navigation stations on the ground. This training can be conducted under Instrument or Visual Meteorological Conditions (IMC or VMC), and is used primarily to develop instrument flight skills.

Basic Instruments (BI). The first stage of instruction in instrument flying skills in which the student learns to control the aircraft by reference to attitude, position and performance instruments inside the cockpit.

Consolidation. The combining of the Army and Navy UHPT programs into a single program, with the form of the program ranging from independent, collocated programs to fully integrated programs with provisions for meeting service unique training needs.

Enroute Navigation. See Airway Navigation.

Fleet Replacement Squadron (FRS). The Navy's advanced level of helicopter training where students learn mission type skills in the aircraft they will fly in their Fleet assignments.

Familiarization (FAM). The most basic level of training, it encompasses basic flight maneuvers such as takeoffs, landings, hovering, straight and level flight, various types of VMC approaches, etc.

Formation (FORM). Flight maneuvers that consist of operating two or more aircraft in close proximity to one another, where one aircraft provides the lead and the others adjust their airspeed and altitude to maintain position on the first.

Helicopter Tactics (HTAC). The Navy term for mission type training conducted in its UHPT program. The training includes low level terrain flight navigation, confined area operations, external load operations, formation, search and rescue procedures including overwater flight, and shipboard qualifications.

Initial Entry Rotary Wing (IERW) Training. The Army program that includes both undergraduate and advanced helicopter pilot training.

Multiaircraft Operations. The Army term that encompasses formation flight and other maneuvers involving more than one aircraft.

Radio Instruments (RI). The phase of instruction that teaches helicopter flight and navigation skills by reference to ground navigation stations. Radio instruments, along with basic instrument skills, form the foundation for airway or enroute navigation procedures.

Shipboard Qualifications (SQ). Navy UHPT instruction that deals with procedures and maneuvers for shipboard operations, such as takeoffs, landings and instrument approaches.

Tracks. The Army's advanced phase of training that follows the IERW Core.

Undergraduate Helicopter Pilot Training (UHPT). In general, the term used to describe any initial rotary wing flight training, and specifically, the Navy's term for its undergraduate helicopter training (the Army equivalent is the IERW program).

APPENDIX B
TASK/MANEUVER COMPARISON

Army IERW

IERW - Core - Primary

Common to Navy UHPT

Review DD Form 365-4 (Weight and Balance)	X
Prepare Performance Planning Card (PPC)	-
Determine Safe Pedal Control Margin	-
Perform Preflight Inspection	X
Perform Engine Start, Run-up and Before Takeoff Checks	X*
Perform Hover Power Checks	X
Perform Hover Checks	X
Perform Hovering Flight	X
Perform Precision Hover Patterns	X
Perform VMC Takeoff	X
Perform Simulated Maximum Performance Takeoff	-
Abort a Takeoff While Maintaining Safe Aircraft Control	-
Perform Fuel Management Procedures	X*
Perform Straight and Level Flight	X
Perform Climbs and Descents	X
Perform Level Turns	X
Perform Deceleration/Acceleration	X
Perform Climbing and Descending Turns	X
Perform Rectangular Course	X
Perform "S" Turns	X
Perform Traffic Pattern Flight	X
Perform VMC Approach	X
Perform Simulated Precautionary Approach	-
Perform Termination Procedures	X
Perform Before-Landing Checks	X*
Perform Go-Around	X
Perform Confined Area Operations	X
Perform Slope Operations	-
Perform Pinnacle or Ridgeline Operations	-
Perform Shallow Approach To a Running Landing	X
Perform or Describe Emergency Procedures	X
Perform Hovering Autorotation	X
Perform Simulated Engine Failure at Hover	X

<u>IERW - Core - Primary (Cont)</u>	<u>Common to Navy UHPT</u>
Perform Standard Autorotation	X
Perform Simulated Engine Failure At Altitude	X
Perform Standard Autorotation With Turn	X
Perform Low Level Autorotation	X
Perform Power Recovery	X
Perform Simulated Anti-Torque Malfunction	X
Perform Simulated Hydraulic System Malfunction	X
Perform Manual Throttle Operation, Emergency Governor Mode	X
Perform Radio Communications Procedures	X*
Perform Magnetic Compass Familiarization	X*
Perform After Landing Checks	X*
Local Area Orientation	X*
Explain the Relationships of the Flight Controls and Instruments	X
Perform Ground Taxi	X
In-Flight Recovery Procedures	X
<u>IERW - Core - Instruments</u>	
Perform Simulated Engine Failure At Altitude	X
Perform Unusual Attitude Recovery	X
Perform Instrument Maneuvers	
-Straight and Level Flight	X
-Climbs and Descents	X
-Turns	X
-Standard Rate	X
-Steep	X
-Timed	X
-Climbing and Descending	X
-Compass	X
-Acceleration/Deceleration	X
Plan an IFR Flight	X
Perform as a Crewmember (Cockpit Teamwork)	X
Perform Instrument Takeoff (ITO)	X
Perform Radio Navigation (NDB, VOR)	X
Perform Holding Procedures (NDB, VOR, LOC)	X
Describe or Perform Procedures for Two-Way Radio Failure (Lost Communications)	X
Perform Instrument Approach (ADF, VOR, ILS, LOC)	X
Perform Missed Approach	X
<u>IERW - UH-1 Track - Basic Combat Skills</u>	<u>Common to Navy UHPT</u>
Plan a VFR Flight	X
Perform A Hover-Out-of-Ground-Effect (HOGE) Check	-
Navigate by Pilotage and Dead Reckoning	X
Perform or Describe Vertical Helicopter Recovery Procedures (VHIRP)	X*

IERW - UH-1 Track - Basic CombatCommon to Navy UHPTSkills (Cont)

Perform Terrain Following (TERF) Mission Planning	X
Perform TERF Navigation	X
Perform Masking and Unmasking	-
Perform Nap-Of-the-Earth (NOE) Deceleration	-
Perform TERF Flight Takeoff	-
Perform TERF Flight Approach	-
Perform Tactical Communications	-
Procedures/ECCM	
Perform TERF Flight	X
Perform Aerial Observation	-
Transmit a Tactical Report	-
Perform Techniques of Maneuver	-
Perform Evasive Maneuvers	-
Negotiate Wire Obstacles	-
Identify Major U.S. or Allied Equipment and Major Threat Equipment	-
Perform Multi-aircraft Operations	X
Perform Rappelling Procedures	-
Perform External Load Operations	X
Perform Internal Load Operations	-
Reconnoiter and Recommend a Landing Zone or Pickup Zone	-

IERW - UH-1 Track - Advanced CombatSkills

(No new tasks)

IERW - UH-1 Track - Night/Night VisionGoggle (NVG)

Perform a Night Vision Goggle (NVG) Takeoff	-
Perform an NVG Traffic Pattern	-
Perform an NVG Approach	-
Perform an NVG Confined Area Landing	-
Perform Emergency Procedures for Actual or Simulated NVG Failure	-
Perform NVG Blind Cockpit Procedures	-
Operate NVG's	-

Notes:

(1) These tasks are taken from the "Tasks Selected For Training" lists in the IERW Core Primary and Instrument Phases, and the UH-1 Track Basic and Advanced Combat Skills, and Night/NVG Flight Training guides. Tasks that are performed in subsequent phases are listed only once.

(2) Tasks/maneuvers evaluated for specific correlation to tasks in Navy UHPT or, as indicated by "*", those that are included in an already identified task/maneuver.

Navy UHPT

<u>Navy - UHPT - Familiarization</u>	<u>Common to Army IERW</u>
Vertical Takeoff	X
Hovering	X
Turns on a Spot	X
Air Taxi	X
Transition to Forward Flight	X
Climbs, Descents and Level Offs	X
In-Flight Constant Rate Turns	X
Level Speed Change	X
Square Patterns	X
Normal Approach to a Hover	X
Precision Approach to a Hover	X
Vertical Landing from a Hover	X
No Hover Landing	-
Waveoff	X
Touch and Go Pattern Entry, Maintenance and Departure	X
Autorotation Entry	X
Autorotation Flight	X
Power Recovery Autorotation	-
Actual and Simulated Emergency Procedures While Troubleshooting and Coping with Situation	-
Hover in Cross-Wind or Down-Wind	X*
Maximum Load Takeoff	-
Running Landing	X
Recovery from Power Settling	-
Manual Throttle	X
Quick Stop	X
High Speed Approach to a Spot	-
Simulated Engine Failure From Altitude	X
Simulated Engine Failure Airtaxi	X
Simulated Engine Failure Hover	X
Full Autorotation Landing, Low Level Flight (Demonstration Only)	X
Boost Off Flight (Demonstration Only)	X
Simulated Stuck Tail Rotor Control (Demonstration Only)	X
Maximum Glide Autorotation (Demonstration Only)	-
High Speed, Low Level Autorotation (Demonstration Only)	-
Low RPM Recovery (Demonstration Only)	-
Quick Stop from Hover	X
Communications Procedures	X
Review Aircraft Maintenance Records	X
Fuel Management	X

<u>Navy - UHPT - Night Familiarization</u>	<u>Common to Army IERW</u>
Night Vertical Takeoff	X
Night Hovering	X
Night turns on a Spot	X
Night Air Taxi	X
Night Transition to Forward Flight	X
Night Climbs, Descents, Level Offs	X
Night In-Flight Turns	X
Night Level Speed Change	X
Night Normal Approach to a Hover	X
Night Vertical Landing from a Hover	X
Night No Hover Landings	-
Night Waveoff	X
Night Traffic Pattern Entry, Maintenance and Departure	X
Night Autorotation Entry	X
Night Autorotation Flight	X
Night Power Recovery Autorotation	X
 <u>Navy - UHPT - Instruments</u>	
Instrument Takeoff (ITO)	X
Instrument Departure Using Radio Navigation Aids	X
Instrument Departure Using Radar Vectors	X
Level Speed Change	X
Stabilized Climb and Descent	X
Level Constant Rate of Turn	X
Straight and Level Flight	X
Unusual Attitude Recovery	X
Precision Approach Radar (PAR) Approach	X
Airport Surveillance Radar (ASR) Approach	X
Instrument Landing System (ILS) Approach	X
Instrument Missed Approach	X
Compass Card Failure	X
Partial Panel PAR and ASR	-
PAR and ASR Without Horizontal Attitude Gyro	-
Transition from Instrument to Contact Conditions for Landing	X
Transition to Instrument Attitude Reference When Confronted with IMC	X
Transition to Visual Attitude Reference When Confronted with VMC	X
Non-Precision Approach (TACAN, VOR, ADF and ADF/DF)	X
Holding (TACAN, VOR and ADF)	X
 <u>Navy - UHPT - Helicopter Tactics</u>	
Section Takeoff and Landing	X
Cruise Position	X

<u>Navy - UHPT - Helicopter Tactics (Cont)</u>	<u>Common to Army IERW</u>
Cruise Position Climbs, Descents and Turns	X
Breakup and Rendezvous	X
Crossover	X
Parade Position	X
Scouting Line	X
Tail Chase	X
Lead Change	X
Control a Rotary-Wing Aircraft for Shipboard Operations	
Lookout Doctrine	-
Touch and Go Pattern	-
Approach to Final	-
Glidepath and Airspeed on Final	-
Line Up	-
Hover Over a Deck Spot	-
Response to Landing Signalman Enlisted (LSE)	-
Vertical Landing to a Deck Spot	-
Vertical Takeoff from a Deck Spot	-
Transition to Forward Flight and Climb from Ship	-
Hover Over Water	-
Tactical Approaches	X
Confined Area Takeoff and Landings	X
Night Glideslope Approach	-
Indicator Light (GAIL) Approaches	
Night VFR Navigation	X
Tactical Formation	X
Terrain Flying (TERF)	X
TERF Navigation	X
Section High Speed Approaches	-

Notes: (1) These task/maneuvers are taken from the Navy UHPT Curriculum Outline.

(2) Tasks/maneuvers are compared for correlation to similar tasks/maneuvers in Army IERW or, as indicated by "*", are an implied part of an already identified task.

APPENDIX C

ARMY IERW CORE ACADEMIC/FLIGHT SUPPORT INSTRUCTION

Academics

Training Annex	Subject	Hours
C	Primary Academics	
	Contract Academic Briefing	1.0
	Physics of the Atmosphere and Pressure Instruments	3.0
	Magnetic Compass	2.0
	UH-1 Avionics and Radio Phraseology	3.0
	Aircraft Structure and Airframe	1.0
	Aircraft Hardware and Safetying Procedures	1.0
	Aircraft Forms and Records	2.0
	Aircraft Mishap Prevention and Investigation	1.0
	Wake Turbulence	1.0
	Flight Support Subjects Examination	2.0
	Rotary Wing Aerodynamics	11.0
	Aerodynamics Examination	2.0
	Aviation Weather	23.0
	Weather Examination	2.0
	Aeronautical Chart Symbols	2.0
	Distance and Direction	2.0
	Wind effect and Variation/Deviation	2.0
	Navigation Practical Exercise I	1.0
	Navigation Computer Slide Rule	3.0
	Navigation Computer Wind Face	2.0
	Flight Plans	1.0
	VFR Cross Country Flight Planning	3.0
	General and Visual Flight Rules-Primary	3.0
	Navigation Diagnostic Review and Seminar	3.0
	Practical Exercise II and III	
	Navigation Examination	3.0
	TOTAL	80.0
E	UH-1 Aircraft Systems	
	Fuel System	3.0
	Power Plant and Related System	4.0
	Rotor System	2.0
	Power Train System	2.0

Flight Control System	3.0
Electrical System	2.0
Weight and Balance	3.0
General Description	3.0
<u>Systems Examination</u>	<u>3.0</u>
TOTAL	25.0

G	Instrument Academics	
	Attitude Instrument Flying	3.0
	General, Visual and Instrument Flight Rules	3.0
	Introduction to Radio Navigation	1.0
	Radio Magnetic Indicator	7.0
	Diagnostic Review Practical Exercise and Seminar Instrument Part I	2.0
	Instrument Examination Part I	3.0
	Radio Navigation	3.0
	Instrument Practical Exercise and Seminar Part II	3.0
	Air Traffic Control Clearances and Agencies	1.0
	DOD FLIP Navigation Charts and SIDS	3.0
	DOD FLIP Exercise	5.0
	Instruments Practical Exercise and Seminar Part III	3.0
	Instrument Examination Part III	4.0
	Navigation Computer Exercise	1.0
	Weather Flight Planning	1.0
	IFR Flight Planning	15.0
	<u>Instrument Flight Planning Examination</u>	<u>5.0</u>
	TOTAL	66.0

J	Survival, Evasion, Resistance and Escape (SERE)	
	Aviator Life Support Equipment	4.0
	Survival Medicine	2.0
	Procurement of Food and Water	2.0
	Physiology of Food	1.0
	Land Navigation, Firemaking and Shelters	2.0
	Travel, Personal Protection and Camouflage	2.0
	Evasion	2.0
	Introduction to Resistance	2.0
	Prisoner Exploitation	3.0
	PW Organization	3.0
	<u>SERE Examination</u>	<u>2.0</u>

	TOTAL	25.0
X	Professional Development	
	<u>Duty and Honor</u>	1.0
	TOTAL	1.0
<u>Flight Support</u>		
A	Course Orientation	
	Course Overview	1.0
	Roles of Army Aviation	2.0
	<u>Algorithm Testing</u>	2.5
	TOTAL	5.5
B	Aviation Medicine	
	Aviation Medicine Orientation	1.0
	Aviation Protective Equipment Orientation	2.0
	Altitude Physiology	3.0
	Altitude Chamber Orientation	1.0
	Altitude Chamber	2.0
	Noise in Aviation	1.0
	G-Forces	1.0
	Spatial Disorientation and Sensory	3.0
	Illusions of Flight	
	Stress and Fatigue	2.0
	Vibration	1.0
	Toxicology	1.0
	<u>Aviation Medicine Examination</u>	2.0
	TOTAL	20.0
E	UH-1 Systems	
	Performance Planning	7.5
	<u>Air to Ground Engagement System</u>	1.0
	TOTAL	8.5
G	Instrument Academics	
	Approach Procedures	9.0
	Holding Procedures	3.0
	<u>IFR Communications</u>	3.0
	TOTAL	15.0
L	UH-1 Basic Combat Skills	
	Terrain Flight Operations	5.0
	<u>Terrain Flight Operations Examination</u>	2.0
	TOTAL	7.0
T	Student Critiques	
	Primary Critique	1.0
	<u>Instrument Critique</u>	1.0
	TOTAL	2.0

These items are taken from the IERW POI Course Lesson Sequence Summary and represent the Academic and Flight Support instruction found in the Core Syllabus.

The distinction between Academic and Flight Support topics is not clearly defined in the POI; they are classified as such here for purposes of comparison.

APPENDIX D

ARMY IERW CORE SYLLABUS SUMMARY

Academics and Flight Support

<u>Subject</u>	<u>Hours</u>
Course Orientation	3.5
Primary Academics	80.0
UH-1 Aircraft Systems	33.5
Instrument Academics	81.0
Survival, Evasion, Resistance and Escape (SERE)	25.0
Aviation Medicine	20.0
Map Interpretation Terrain Analysis Course, Day	7.0
Course Critiques	2.0
Professional Development	1.0
TOTAL	253.0

Simulator

<u>Element</u>	<u>Periods</u>	<u>Hours</u>
Cockpit Procedures Trainer	5	7.5
<u>Flight Simulator</u>	<u>20</u>	<u>30.0</u>
TOTAL	25	37.5

Flight Training

<u>Element</u>	<u>Periods</u>	<u>Hours</u>
Primary, Stage I Stage I	20	18.5
Primary, Stage II	30	41.5
<u>Instrument, Stage II</u>	<u>20</u>	<u>20.0</u>
TOTAL	70	80.0

APPENDIX E

IERW UH-1 TRACK SIMULATOR/FLIGHT TRAINING SUMMARY

Basic Combat Skills

Flight Topic	Events	Hours
Terrain Flight	14	20.6
Day VFR Navigation	8	9.9
Map of the Earth Flight	9	13.5
TOTAL	31	44.0

Advanced Combat Skills

Flight Topic	Events	Hours
Multi-Aircraft/Terrain Flight	10	13.8
TOTAL	10	13.8

Night/Night Vision Goggle

Simulator Topic	Events	Hours
Night Vision Goggle	1	1.5
TOTAL	1	1.5

Flight Topic	Events	Hours
Night Familiarization	2	2.5
Night/Night Vision Goggle	16	21.0
TOTAL	18	23.5

APPENDIX F

NAVY UHPT SYLLABUS CONTENT SUMMARY

Academics/Flight Support

<u>Topic</u>	<u>Hours</u>
Aerodynamics	11.0
Engineering	16.0
Instrument Navigation	26.8
Welcome Aboard	3.0
Safety	1.0
Preflight and Cockpit Procedures	3.0
Course Rules Exam	1.0
NATOPS Open/Closed Book Exams	6.0
Flight Procedure Seminars	
VFR Navigation	2.0
Emergency Procedures	2.0
Course Rules	2.0
Basic Instruments	2.0
Radio Instruments	4.0
Airways Navigation	2.0
Formation, External Loads,	2.0
Confined Area Landings Course	
Rules	
Low Level VFR, Formation Brief	2.5
Mission Brief, Shipboard	2.0
Operations	
Search and Rescue Procedures	1.0
Map Interpretation	7.0
TOTAL	96.3

Simulator

<u>Stage</u>	<u>Periods</u>	<u>Hours</u>
Cockpit Procedures	5	6.5
Emergency Procedures	1	2.6
Basic Instruments	6	7.8
Radio Instruments	8	20.8
Airways Navigation	1	2.6
Helicopter Tactics	2	2.6
TOTAL	23	42.9

Flight Training

<u>Stage</u>	<u>Periods</u>	<u>Hours</u>
Familiarization	17	25.8
Operational	4	6.3
Navigation		
Night Familiarization	1	2.0
Transition Flight	5	9.0
Basic Instrument	7	11.0
Radio Instrument	10	20.0
Airways Navigation	6	11.0
Helicopter Tactics	18	30.0
Aviation Ship	2	1.0
Qualification		
TOTAL	70	116.1

This summary was extracted from the Navy UHFT
(TH-57) Master Curriculum Guide.

APPENDIX G

NAVY NON-UHPT AVIATION TRAINING

Academics and Flight Support

<u>Course</u>	<u>Subject</u>	<u>Hours</u>	<u>Applicable*</u>
Aviation Preflight Indoctrination (API)	Aerodynamics	29.0	20.0
	Engineering	16.0	15.5
	Air Navigation	26.0	26.0
	Aviation Physiology	10.0	9.0
	Water Survival	41.0	0.0
	Training		
	Land Survival	58.5	8.0
	Physical Fitness	22.5	22.5
	Training		
	Aviation Student	2.0	2.0
	Information		
	Special Emphasis	2.0	2.0
	Topics (Drug and Alcohol Abuse; Equal Opportunity Programs)		
	<u>TOTAL</u>	<u>208.0</u>	<u>106.0</u>
Primary Flight Training	Academics		
	Meteorology Theory	12.8	12.8
	Flight Rules and	8.0	8.0
	Regulations		
	Meteorology Flight	20.0	20.0
	Planning		
	Instrument	37.0	37.0
	<u>Navigation</u>		
	<u>TOTAL</u>	<u>77.8</u>	<u>77.8</u>
	Flight Support		
	None Applicable		
Intermediate Helicopter Training	Academics		
	None		

Flight Support		
Radio Instruments	1.5	1.5
Visual Navigation	4.0	4.0
Visual Navigation	1.5	1.5
<u>Examination</u>		
TOTAL	7.0	7.0

Simulator and Flight Training

<u>Course</u>	<u>Subject</u>	<u>Hours</u>	<u>Applicable*</u>
Primary Flight Training	Simulator		
	Basic Instruments	9.1	9.1
	Radio Instruments	11.7	11.7
	<u>TOTAL</u>	20.8	20.8
	Flight		
	Familiarization	25.0	0.0
	Basic	6.8	6.8
	Instruments		
	Precision	8.3	0.0
	Acrobatics		
	Formation	11.6	0.0
	Night	3.0	0.0
	Familiarization		
	Radio Instruments	11.7	11.7
	<u>TOTAL</u>	66.4	18.5
Intermediate Helicopter Training (T-34C)	Simulator		
	Radio Instruments	7.8	7.8
	Airways Navigation	2.6	2.6
	<u>TOTAL</u>	10.4	7.8
	Flight		
	Radio Instrument	10.0	10.0
	Visual Navigation	7.0	0.0
	<u>Airways Navigation</u>	9.0	9.0
	<u>TOTAL</u>	26.0	19.0

* - Applicable for carryover to a consolidated syllabus to compensate for elimination of fixed wing training.

APPENDIX H

UHPT TRAINING AIRCRAFT

Army IERW Core

UH-1 Dual seat, single engine, turbine powered helicopter. Fully instrumented, used for both Primary and Instrument phases of Core instruction.

Navy UHPT

T-34C Dual seat, single engine, turboprop trainer aircraft. Used for all Primary Flight and Intermediate Helicopter Training.

TH-57 Dual seat, single engine, turbine powered helicopter. Two models, the "B" and "C", are used for various types of instruction. The "C" model is designated an advanced instrument trainer and is used primarily for BI/RI/AN, late HTAC stage and SQ flights.

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